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Contributors who wish their articles to appear in the next number are requested to forward them before the 10th of January to the Editor,

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The following works have been received for review :

A System of Practical Medicine by American Authors. Edited by WILLIAM PEPPER, M.D., LL.D., Provost, and Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania. Assisted by LOUIS STARR, M.D., Clinical Professor of the Diseases of Children in the Hospital of the University of Pennsylvania. Vol. III. Diseases of the Respiratory, Circulatory, and Hæmatopoietic Systems. Philadelphia : Lea Brothers & Co., 1885.

The Essentials of Pathology, Descriptive and Practical, for the use of Students. By E. A. SCHÄFER, F.R.S., Jodrell Professor of Physiology in University College, London. Philadelphia : Lea Brothers & Co., 1885.

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Manual of the Diseases of Women : being a Concise and Systematic Exposition of the Theory and Practice of Gynecology. For use of Students and Practitioners. By CHARLES H. MAY, M.D., late Physician Mt. Sinai Hospital, New York. Philadelphia : Lea Brothers & Co., 1885.

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Litholapaxy (Modern Lithotrity). One hundred and eleven cases. By P. J. FREYER, M.A., M.D., M.Ch. Calcutta, 1885.

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De la Ligature de l'Aorte Abdominale. Par le Dr. P. LIEBRECHT. Liège, 1885.

Castration der Frauen. Von Docent Dr. A. MARTIN. Berlin, 1885.

Sur la cystite et la néphrite produits chez l'animal sain par l'introduction, dans l'urètre, du micrococcus ureæ (Cohn). Par MM. R. LÉPINE et GABRIEL ROUX.

A Case of Moral Insanity, with Removal of the Ovaries, and Recovery. The Care of the Insane at Home and Abroad. By W. B. GOLDSMITH, M.D., Superintendent of the Danvers Lunatic Hospital, Danvers, Mass. Reprint.

Note on a Form of Post-Neuralgic Insanity. By C. H. HUGHES, M.D. 1885

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Rupture of the Spleen from a Phlebotomy. Uterus Bicornis. By CHARLES T. DARNALL, M.D. Chicago, 1885.

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The Physiological Effects of Massage. By BENJAMIN LEE, A.M., M.D. Philadelphia, 1885.

The Surgical Treatment of Cysts of the Pancreas. By N. SENN, M.D., of Milwaukee, Wis., Surgeon to the Milwaukee Hospital.

Puerperal Mania. By T. K. HOLMES, M.D., Chatham.

Reflections on the Ætiology of Simple Inflammatory Affections of the Upper Air-Passages. By JOHN N. MACKENZIE, M.D., Baltimore.

A Contribution to the Study of Congenital Syphilis. By JOHN N. MACKENZIE, M.D., Baltimore.

Report on Ophthalmology, read before the California State Medical Society. By A. M. WILDER, M.D. Some Notes on the Pathology of Intranasal Inflammation. By JOHN N. MACKENZIE, M.D., of Baltimore, Maryland.

Iritis; its relation to Rheumatic Diathesis, and its Treatment. By CHARLES J. LUNDY, A.M., M.D., Professor of Diseases of the Eye, Ear, and Throat in the Detroit College of Medicine.

Exenteration of the Eye. A Substitute for Enucleation. By MIDDLETON MICHEL, Professor of Physiology and Medical Jurisprudence in the Medical College of the State of South Carolina.

Erysipelas of the Larynx and Pharynx. By D. BRYSON DELAVAN, M.D., New York. New York, 1885.

On Provision for the Insane. By JOHN B. CHAPIN, M.D., Pennsylvania Hospital for the Insane.



Treatment of the Umbilicus in the Newborn. Why should we use the Belly-band on the Infant?  
By E. ST. KING, M.D., West Liberty, Iowa.

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A Case of Fatal Ear Disease, beginning as a Circumscribed Inflammation in the outer half of the External Auditory Canal. By CHARLES J. KIPP, of Newark, N. J.

Intubation of the Larynx, with a history of Cases. By F. E. WAXHAM, M.D., Professor of Diseases of Children, College of Physicians and Surgeons, Chicago.

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Transactions of the American Otological Society, 1885.

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Upsala Läkareförenings Föreläsningar.  
Kronika Lekarska.  
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Archivio di Orthopedia.  
Gazzetta degli Ospitali.  
Gazzetta Medica di Torino.  
La Medicina Contemporanea.  
Giornale Italiano delle Malattie Venere e della Pelle.  
L'Imparziale.  
Lo Sperimentale.  
Rivista Internazionale di Medicina e Chirurgia.  
Gazette Médicale de l'Orient.  
O Correio Medico de Lisboa.  
Cronica Medico-Quirurgica de la Habana.  
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Allgemeine wiener medizinische Zeitung.  
Berliner klinische Wochenschrift.  
Centralblatt für Chirurgie.  
Centralblatt für Gynäkologie.  
Centralblatt für klinische Medizin.  
Centralblatt für die medicinischen Wissenschaften.  
Centralblatt für die gesammte Therapie.  
Deutsches Archiv für klinische Medizin.  
Deutsche medicinische Wochenschrift.  
Medicinisch-Chirurgisches Centralblatt.  
Medizinische Jahrbücher.  
Monatshefte für praktische Dermatologie.  
Wiener medizinische Presse.  
Zeitschrift für physiologische Chemie.  
Annales de Dermatologie et de Syphiligraphie.  
Annales de Gynécologie.  
Annales des Maladies Genito-Urinaires.  
Archives de Médecine et de Pharmacie Militaires.  
Archives de Neurologie.  
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Archives Générales de Médecine.  
Bulletin Générale de Thérapie.  
Gazette Hebdomadaire de Médecine et de Chirurgie.  
Gazette Médicale de Nantes.  
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On Anæsthesia. By R. MILNE MURRAY, M.B.

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Urinary and Renal Derangements and Calculous Disorders. Hints on Diagnosis and Treatment. By LIONEL S. BEALE, M.D., Fellow of the Royal Society, etc.

A Practical Treatise on Urinary and Renal Diseases, including Urinary Deposits. Illustrated by numerous cases and engravings. By WILLIAM ROBERTS, M.D., F.R.S., etc., assisted by ROBERT MAGUIRE, M.D.

A Practical Treatise on Diseases of the Kidneys and Urinary Derangements. By CHARLES HENRY RALFE, M.A., M.D. Cantab., etc.

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A Practical Treatise on the Diseases of Children. Third American from the eighth German edition. Revised and enlarged. Illustrated by six lithographic plates. By ALFRED VOGEL, M.D., Professor of Clinical Medicine in the University of Dorpat, Russia. Translated and edited by H. RAPHAEL, M.D., late House Surgeon to Bellevue Hospital; Physician to the Eastern Dispensary for the Diseases of Children, etc. 206

#### Recent Works on Chemistry.

Principles of Theoretical Chemistry, with special reference to the Constitution of Chemical Compounds. By IRA REMSEN, Prof. of Chemistry in the Johns Hopkins University.

Inorganic Chemistry. By EDWARD FRANKLAND, Ph.D., D.C.L., LL.D., F.R.S., Prof. of Chemistry in the Normal School of Science, London, and FRANCIS R. JAPP, M.A., Ph.D., F.I.C., Assistant Prof. of Chemistry in the Normal School of Science, London.

A Treatise on Practical Chemistry and Qualitative Inorganic Analysis, adapted for use in the Laboratories of Colleges and Schools. By FRANK CLOWES, D.Sc. Lond., Prof. of Chemistry at the University College, Nottingham.

Manual of Chemistry. A Guide to Lectures and Laboratory Work for beginners in Chemistry. By W. SIMON, Ph.D., M.D., Prof. of Chemistry and Toxicology in the College of Physicians and Surgeons, Baltimore, etc.

The Medical Student's Manual of Chemistry. By R. A. WITTHAUS, A.M., M.D., Prof. of Chemistry and Toxicology in the University of Buffalo, and in the University of Vermont, etc.

A Text-book of Medical Chemistry for Medical and Pharmaceutical Students and Practitioners. By ELIAS H. BARTLEY, M.D., Adjunct Prof. of Chemistry and Lecturer on Diseases of Children in Long Island College Hospital, etc.

FOWNES' Manual of Chemistry, Theoretical and Practical. A new American from the twelfth English edition, embodying Watt's "Physical and Inorganic Chemistry."

Chemistry: General, Medical, and Pharmaceutical, including the Chemistry of the U. S. Pharmacopœia. By JOHN ATTFIELD, F.R.S., M.A. and Ph.D. of the University of Tübingen, etc.

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MODERN MEDICINE OF THE ENGLISH-SPEAKING RACE.

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THE complex fabric of modern civilization is surrounded by an upheaval of thought unparalleled in variety and unequalled in extent of movement, at any period of man's history. Ancient ideas give way at almost every point to the assertions, speculations, and discoveries of the day. These spring up with so great rapidity that there is scarcely time to estimate their import, or to weigh their value. We watch wave following wave on the ocean shore, and we notice how, after a momentary existence, each is overwhelmed by the one that follows, and both are soon merged in the past. The bystander, for his short time, notes fresh masses forming in constant succession, advancing, breaking. The new seem like the old in form. Yet no two are exactly the same, save only in this, that they advance, recede, and perish.

The course of human thought is not wholly unlike these inanimate forces thus ceaselessly brought into play. Yet human thought has another quality connected indissolubly with it, and illustrated by the cosmical actions operating in our planet. Human thought, like life in this globe of ours, has in it an element of steady progress and of development which does not accompany the restless movements of the ocean tide.

These advance and recede, to advance again; but the changes they effect, great though they be when looked at through uncounted ages, are



changes limited strictly in degree and strictly in kind. In life on the globe, evolution, if neither uniform nor steady, has been at all events progressive, if tested by any rational test of progress. Human thought, like life in the earth, has advanced in most directions, even though it have in some gone back.

As the material organisms, those marvellous machines which make mental action in this world possible, have, on the whole, become more perfect through prehistoric periods, so the mass of human knowledge, since we have record of the human race, has become greater, purer, truer. With all our errors, with all our blindness, and with all our backslidings, there is steadfast yearning after truth, and an ever reaching forwards toward good. Our conception of the relation we hold to the whole order of things is more clear, and is, perhaps, more true. The light of keen criticism is turned with full blaze on every quarter, and from every side. Though the variously colored rays impart not seldom confusion more bewildering than darkness, in the end, the "*lumen siccum*," the pure white light for the most part prevails. It then at once illuminates, defines, and warms.

In nothing are these analogies more true than in the history of medicine. Nor can a better illustration be found in that history than in the undertaking to which these few words are to form an introduction. Would that it had fallen to a stronger hand to pen them.

It is proposed to issue a quarterly journal of purely scientific and practical medicine, which is to be, in certain directions, a common vehicle of medical thought for the English-speaking race. It is a great project, and one worthy of success, though open to criticism for its daring. Into the prospects of such an undertaking, looked at from a commercial or the publisher's point of view, this is not the place to enter. That, no doubt, has been fully considered. Nor is it here, either, that should be fully discussed all the objections that may be raised from the scientific and literary side. The criticisms that may be reasonably advanced should, however, be frankly acknowledged. They are few, and to these the answer is simple. Although the existing number of medical journals, to be counted by several hundreds, is so great, yet there is no journal with the aim of the present. The sole questions, therefore, in this direction are as to the wisdom of the aim.

First. The aim being admitted to be good, it cannot be attained. To this objection a short reply may be given in the form of an axiom. The conditions of the English-speaking race are such, geographically and politically, and the means of intercommunication are so unceasing, that it is an imperative duty, in the interest of mankind, to collect periodically into suitable form the information which they furnish, as being most important, and progressively important, for the promotion of public and personal health throughout the world.



Secondly. That the aim is too narrow. Be it so. The aim is wide enough. It is indeed true, that an attempt to formulate certain data bearing on the diseases of the whole human race has been already begun, and that the successful inauguration of a Committee for the International Collective Investigation of Disease, last year at Copenhagen, will produce, it is to be hoped, a permanent effect on investigation and on literature. This quarterly journal will in no sense interfere with that great undertaking. It will neither forestall it, nor lag behind it. It will aid it, on a different line. It will make use of its results and it will further its objects. How this is, will be seen more fully at a later stage of the following observations.

We have to call to mind that the art of medicine began, without doubt, from the simple desire to obtain and to afford relief in diseases, and other injuries. To staunch a wound, to unite, if possible, a fractured limb, to quench a burning thirst, were objects manifestly to be attained. Natural love led the family or the friends to fulfil this service. Those most apt would then, in similar conditions, be the most sought for again. The nurse would quickly found a profession, which would attract admiration and earn gratitude. Women and men would alike follow it. The arts of Surgery and Medicine, however rudely, would thus be established; and, conjointly or separately, would gain their hold as integral parts of the tribal organization. So beneficent and noble a work would need the appearance on earth of a gifted soul like Hippocrates, to establish a definite art, or mystery, and to suggest a future and possible science. This once begun would never cease. All the virtues and all the vices of an established guild would be rapidly stereotyped. Truth and falsehood, honesty and pretension, learning and ignorance, true observation and mistaken inferences, authority and subservience, factious opinions, misleading self-assertion, feebly opposed by moderation, which is seldom popular, would all take their place. Rapidly would the most intricate, the most amazing, the most subtle of all created things, the human frame in health and in disease, become the centre of traditional beliefs, some true and noble, some false and degrading. And as the human race became developed, or the world more thickly inhabited by the human family, and the interchange of ideas more regular and more facile, sound knowledge bearing on the physical needs of man, on his physical education, and on the modes of perfecting its stamina, and procuring his euthanasia at the time of his departure, would be handed on from one to another people, accompanied by the natural and inevitable result of national prejudice, and of faulty generalization from misapplied and mistaken similarities.

And in truth this, to speak roughly, is the history of medicine in the world up to the present century. This century is the century of criticism and of experiment. It is, therefore, the age of transition. In

the course of its criticism, and its experiments, and in its transition, it has had to devise new methods. By its new methods it has acquired new powers. Two of the chiefest of these powers are: first, a multitudinous host of individual skilled observers, flooding the world with precise individual observations; and, secondly, the organization of associations for the direction of inquiry, the sifting the wheat from the tares, in the vast harvest gathered by individual reapers, and the reducing of isolated data into principles and laws.

It has been wisely said that there are times in a man's life when he should ask, where he is, whence he comes, whither he is going. The same severe questioning may be, and should be, put to themselves by most nations, and with reference to many kinds of subject matter. If we put it to Medicine, it is not hard to answer. Prophecy being rash, the third question, which is of the most moment, whither it is going, demands the most careful reply, and may for the moment be deferred. To the second question a reply has already in fact been given. Medicine is in possession of a heterogeneous mass of real and of supposed knowledge, accumulated at the lowest computation, during 3500 years, in which the principles and conclusions of great men have floated in a sea of statements and traditions, unparalleled except by the accumulated follies of false religions.

To the first, "Where we are," the reply is that, as has also been said, "We are in a new era of precise observation, of experiment, and of criticism, with all their advantages and their dangers."

And so the reply to the third is, that we are going whither the balance of these three great factors of scientific progress may lead us.

Whither this may be, it is, upon the whole, not far to seek.

For 1st. What is the true function of medicine as we now view it?

2d. How is this function to be best carried on? that is to say, what are the factors upon which the science and art of medicine, at the present age of the world, depend?

1st. As was remarked just now, the origin of medicine was the benevolent desire to relieve suffering; and so it was synonymous with the "healing art." Its function has become far wider. Whatever be the duty of individuals, medical art and science collectively now aim, as a whole: 1st, at the preservation of health; 2d, at the averting disease from individuals and from nations; 3d, at rearing healthy progeny for the family and the State, by probing the laws of inheritance; and, 4th, by procuring legislation effectual to these several ends.

It claims, therefore, a right to a voice in moral education as well as physical training; it holds a duty in relation to the diminution of vice for the sake not only of its self-destroying victims, but more for the sake of the innocents whom they ignorantly slay. In short, medical science, openly or unseen, pervades and influences our private and public life

from the kitchen to the camp and the fleet; from the cottage to the palace. It sends its messages to the school, its dictates to municipal organizations. It performs these duties equally with its infinite services in hospitals to the sick; in refuges for the insane, and in the homes of the convalescents.

If we ask by what agencies medicine purposes to qualify itself to perform openly or silently such complicated preventive and preservative, as well as curative, functions, the reply which we receive is some such as this: "By appropriating all the confirmed conclusions of the biological sciences which bear on the health and the inheritance of the human race, however descended, and under whatever climatic and local conditions situate."

A moment's reflection only is needed to show the vastness of the inquiry contained in this statement. It affirms that which cannot be reasonably contradicted, that the complete science of the prevention of disease, and of the preservation of health in man, will include a knowledge of all conditions in which any branch of the human family is placed, and of the relations of individuals of the family by descent and inheritance one to the other, to a common origin, or a diverse stock. In short, it will be based on the conclusions of a progressive morphology, physiology, and embryology, comprising, as they do, the history of all things that in our planet have life. It will, moreover, study the relation of life to all matter in our world which does not possess the properties called living, and the *modus operandi* of all cosmical forces in the two kinds of matter, respectively, the forces, that is, that belong to all matter, and the combination of them, whatever that may be, which operates in living things, and which for distinction, and as the lawyers say, without prejudice, is now called in the place of the old vital principle, metabolism. When through the perfected knowledge of physics and chemistry, and of climates in their application to living organisms, and when through the teachings of pathological evolution now looming in the distance, we know the conditions of health, then, not till then, will the ideal standard, which is to test what is "not health," have been attained.

Morphology, physiology, embryology, attempt to lay down the laws of the normal organism, vegetable or animal, of every degree of perfection, wherever situated, at whatever period of the world existent, however evolved. These sciences being in no sense arts, are still intimately connected with the great subject of disease, or pathology. This is intermediate between the three pure organic sciences, and the art of therapeutics which rests upon both, and contributes factors to both. And first as to pathology in its relations to this paper. If the borders of the three organic sciences just named are as extensive as has been said, those of pathology cannot be narrower. For there are the disorders



of all plants, and all animals, and all races of man, and departures from the normal health standard as numerous as the "species," perhaps as numerous as the individuals, or the families to which they belong. They are, moreover, indeed as numerous as the organs, and the textures of each, without reckoning the general diseases which are not confined to organs and textures, but affect the whole organism. As the subject opens up it would seem to bewilder from its extent and complexity. For this bewilderment the remedy will presently appear. The fact remains, and it can be no other.

As there is a similarity more or less great, more or less divergent, in the life conditions of all living organisms on our planet, both in respect of their past history and their present normal mechanism, function, and origin, so must there be between their several non-health tendencies and acquired abnormalities. Although happily for us, these are not all intercommunicable, it has been proved, as is known to every one, that between certain diseases of man and of other animals there is not only a casual and accidental, but an actual and necessary relation, as in some of the entozoa, and in a not necessary, but a possible, way, in tubercle and other disorders. Nor is this all. For as there is this correlation between the possible disorders of certain organisms one with the other, so the correlation probably does not exist equally in every part of the globe, but only in some parts, that is, the infectivity depending on climate or on localized microbes, is not everywhere the same.

Another factor has to be added, and a striking one, viz., that diseases have a history of time, as well as of place, and that they have appeared and disappeared, at varying periods, some at very long, and some at short intervals; and they have remained in varying degrees of intensity for many centuries in a manner more or less constant, of which the most notable illustrations may be found in cholera and in leprosy, both in respect of time and of place.

And lastly, there is the vast pathological question of inheritance of disease, whether in man or in animals. Only two need be alluded to in illustration, epilepsy and syphilis. The former has been elucidated by the experiments of Brown-Séquard, and the latter by innumerable observations and inquiries in almost every country for the last four centuries, with regard to this ancient scourge of humanity. The mere mention of these four, cholera, leprosy, epilepsy, and syphilis, raises in every well-informed mind an almost overwhelming cloud of thought in the direction of causes, disasters, and remedies, operating through thousands of years on the human race. The attempts to form a science of the diseases of mankind on a really scientific basis, have received great impulse from the *Handbook of Historical and Geographical Pathology*, prepared, with marvellous labor and philosophical insight, by Professor Hirsch, of Berlin. This work, accessible now to all English readers, has once for

all laid a foundation on which all the vast accumulating mass of pathological observation in the world of medical inquiry may be systematically and scientifically classified and arranged.

The third great department of scientific medicine to which reference should here be made, that of therapeutics, belongs in a greater degree to the category of an art than either physiology (in its three subdivisions) or pathology; but not for this reason is therapeutics either less definite or less in need of scientific handling. It is sometimes supposed that therapeutics is mainly empirical. There can be no greater error. It is, in fact, based either on positive science, or it is experimental. It rests either on certain knowledge definitely ascertained, and precisely used, in which case it has known results which can be foretold, or it rests on experiment, in which case the experimenter, as in a purely scientific experiment, extorts from nature an answer valuable according to the knowledge and skill which he brings to bear on the individual case. Therapeutics, like physiology and like pathology, concerns itself in these days with the whole range of disease in organized nature. Now it deals with the vegetable world, as in the case of the potato disease, or the vine disease; now with lower animal forms, as in the diseases of the silkworm, the battle-ground and great victory of Pasteur. Now it experiments on the domestic animals useful to man, as in the anthrax of sheep, a further triumph of that great observer; or it studies the treatment and prevention of the plague in the bovine races. In all these several cases, therapeutics finds entangled in its meshes thousands upon thousands of observations and statements, resting on authority of every degree, whether of high value or of utter worthlessness. It were an error to suppose that we have reached a time when none but scientifically tested assertions find their way into the current literature of therapeutics. This is not the time or place for discussing this matter; yet, by the way, it must in truth be said that, notwithstanding the brilliant discovery of certain true remedies, and of invaluable palliatives of modern times (such as quinine, chloroform, and iodine); and notwithstanding the precise correlation established in many cases between the lessons of normal physiological experiment, and therapeutical action in abnormal states, there has been no period in medical history in which a greater number of reckless assertions are yearly sent broadcast into the world. To name instances would here be out of place. They will occur to every reader.

The observations and records of physiology and of pathology, though in different degrees, have been derived in large measure from organisms other than man, by means of experiment. The most extensive, and by far the most accurate teachings of therapeutics, come from observation and treatment of man, chiefly in the great hospitals of the Christian era. The astonishing acumen of Hippocrates, Galen, Aretæus, and a

few more of the ancients, must not be forgotten. But the want of anatomical precision, and of the results of microscopic research, make the records even of Morgagni, comparatively, of small value. The observations of trained observers—trained, that is, in the purely scientific methods of physiology—before proceeding to the study of disease in the highest organisms, will produce, and are producing, results by the bedside of equal therapeutical value; perhaps, indeed, of greater truth than those of the experimenter on animals. Morbid action is a great physiological teacher. It has to be observed that, in the study of human therapeutics, a new element is introduced. This element shall be expressed in the words of one of the most attractive clinical teachers of this century.

“Diseases are not abstractions; they are modes of acting, different from the natural and healthy modes—modes of disorganizing, modes of suffering, and modes of dying; and there must be a living, moving, sentient body for all this.

“This body must be your study and your continual care—your active, willing, earnest care. Nothing must make you shrink from it. In its weakness and infirmities, in the dishonors of its corruption, you must still value it, still stay by it, to mark its hunger and thirst, its sleeping and waking, its heat and its cold, to hear its complaints, to register its groans.

“And is it possible to feel an interest in all this? Aye, indeed, it is; a greater, far greater, interest than ever painter or sculptor took in the form and beauties of its health.

“Whence comes this interest? At first, perhaps, it seldom comes naturally; a mere sense of duty must engender it; and still, for awhile, a mere sense of duty must keep it alive. Presently the quick, curious, restless spirit of science enlivens it, and then it becomes an excitement, and then a pleasure, and then the deliberate choice of the mind.

“When the interest of attending the sick has reached this point, there arises from it, or has already arisen, a ready discernment of diseases, and a skill in the use of remedies. And the skill may exalt the interest, and the interest may improve the skill, until, in the process of time, experience forms the consummate practitioner.

“But does the interest of attending the sick necessarily stop here? The question may seem strange. If it has led to the readiest discernment and the highest skill, and to form the consummate practitioner, why need it go further?

“But what if humanity should warm it? Then this interest, this excitement, this intellectual pleasure, is exalted into a principle and invested with a moral motive, and passes into the heart. What if it be carried still further? What if religion should animate it? Why, then, happy, indeed, is that man whose mind, whose moral nature, and whose spiritual being, are all harmoniously engaged in the daily business of his life? with whom the same act has become his own happiness, a dispensation of mercy to his fellow creatures, and a worship of God.

“Such a man any of you may be; but you must begin by learning to stand by the sick-bed and make it your delight.”

So, in 1836, said Latham, no mean disciple of Galen, who nearly seventeen hundred years before wrote at the end of his great treatise “*Περὶ χρείας τῶν ἐν ἀνθρώπῳ σωματικῶν*,” that all his anatomical facts and studies were as hymns sung before the gods.

The temper which is thus inculcated belongs not to him only who truly seeks the alleviation of human suffering, physical or mental, but



to him who, against his nature, is often forced to wrest the secrets of life from living animals lower than men, for their sake and the sake of the whole human race.

The generalities here dimly portrayed have to be considered in their practical relation to the conditions and progress of medicine among English-speaking peoples. This relation is obvious enough, and is two-fold: first, in respect of the subject itself; and, second, in respect of the persons who affect the conditions and retard or promote the progress.

As to the subject little more should be said. The subject is coextensive with every branch of the human family, affects every individual in it, of every age, of every color, and every creed, every government. It concerns men of science, however wide their pursuits or limited their objects in physics, in chemistry, in biology. It concerns all who, though considering scientific study to be neither their duty nor their forte, are devoted to the practical, beneficent, and benevolent charge of the feeble and the sick, of the young and the old. These practical philanthropists are interested in the progress of all true, in the elimination of all spurious statements, from preventive or curative medicine. Every real discovery, every simplification of principle, every blow to specious but unnecessary fancy in this direction, promotes, to some extent, the education of the world. This being so with the quality of the subject, it remains to say a word on the special opportunities which lie within the reach of the English-speaking people for aiding it; and, secondly, on the means actually now employed.

The opportunities are of two kinds, those which occur to official persons and those which are enjoyed by private practitioners. Whether official persons have done all that can be done toward a science of medicine admits of question. But in every part of the English-speaking world they have begun, and in some places have advanced in this century in an unprecedented way. Official documents, accessible to all, emanating from England, Scotland, and Ireland, from India and the Colonies, have thrown a flood of light on the etiology and the prevalence of disease, and have promoted steadily progressive legislation. The United States have taken up the same gigantic work in every department of biology, normal and abnormal, with the rare opportunities of their vast territory, and their various peoples. A glance at the eleventh volume of the *Tenth Census of the United States* will show the success as well as the difficulty of obtaining correct data as to the sanitary condition and vital statistics of the States. But the work is in the hands of Dr. Billings, and that is a guarantee for whatever industry, genius, and philosophic acumen can accomplish in this direction. This statement, so brief, tells that official records are accumulating in one language, as to the health conditions of three hundred millions of people, in almost

every parallel of latitude between the terrible belts of perpetual ice that environ either pole ; on nearly every isothermal line ; by mountain and valley ; among people civilized and uncivilized, of almost every race and inheritance, men of every occupation and trade, living in every condition of luxury or of want ; of every religion ; practised in every act of virtue, and steeped in every form of vice. So that these records alone will presently form the basis of a science of comparative national health.

But besides these great official sources of knowledge, are the far more numerous data, which, in truth, supply them. Witness, for instance, the causes of death, in vital statistics. When Dr. Billings writes that “‘teces,’ ‘colory in phantum,’ ‘colvia fontine,’ ‘hasphmar,’ ‘struck in on the air-cells’ are reported by ‘physicians,’ it is evidently unsafe to lay too much stress on the scientific accuracy of diagnosis by the same reporter in other cases, even although the spelling may be more nearly correct.”

The corollary from this illustration is that every endeavor should be made by public and private means to secure good general education for the medical students of the future. Useless will be the progress of “physiology and pathology and therapeutics” to those districts which are served by “physicians” ignorant of them. On the medical education of the future we may look with not only hope but confidence.

This rude survey must now be brought to a close.

Some apology is offered to science for the assumption that there is room for a scientific journal with the apparent restriction to one language and one human stock. Science has no restriction and a universal brotherhood ; but science has her votaries everywhere, and every language can contribute its share. The present endeavor is to offer to those who seek it a means of hearing a message from English-speaking people, which, apart from politics of every kind, may gather results profitable to medicine, learnt from types of every climate of the globe, from very many races of the most diverse origin, and from every occupation and every condition in which the human family is engaged. The error lies, if anywhere, in the greatness of the attempt. An apology is offered to the International Collective Investigating Committee, if, indeed, an apology be in place. Such an attempt as this to coördinate acquired truths from so wide a range as the English-speaking people can but aid, as has been said before, the profound and detailed inquiries conducted by that body. In no possible way can it rival, surpass, or check its precise labors.

The end, indeed, which one may propose to such a work is this—to bring together at regular intervals the thoughts and active criticism of men, who, bound by the tie of one common language, are still more closely linked by the love of truth applied to perfecting the bodily

nature of man. That bodily nature is the casket which contains the spirit, by which, and which alone, man is separated from the innumerable living cotenants of this planet, so complex, so wonderful, yet so petty, in the complete order of the universe. If England should ask whither she is being led, she may reply that her speech, embracing the States of America and the Australian continent, is called upon more and more to guide races of every color, and every state of evolution. The States alone have almost every climate and every kind of seaboard, and every topographical condition for habitation, and for produce, and every occupation for man.

Therefore, let it be said, that since there are so many races bound together by the same speech to further the cause of human progress, since there are in this brotherhood so many who hold divers forms of true religion, and some, too, who look on all religion as a byword and reproach, it is well they all agree in this faith, that to relieve the suffering and prevent the decay of masses of mankind form a part of all true religion—the religion of universal peace and goodwill toward men.

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## THE MITRAL CARDIAC MURMURS.

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THE study of the mitral cardiac murmurs at the present time is of importance to every medical practitioner, as well as of interest to those whose attention is especially directed to the diseases of the heart. The purpose of this article is a reviewal of the existing knowledge of these murmurs, and an inquiry meets us at the threshold as to the number of them. How many murmurs, the seat of their production being at the mitral valve or orifice, are to be reckoned as mitral murmurs? After the description of the mitral regurgitant murmur by Elliottson, in 1830, for more than a decade of years this was the only mitral murmur recognized as such. Another murmur was added in 1843, by Fauvel, who first described distinctly the mitral direct murmur, named by him and known at the present time as the mitral presystolic murmur. The recognition of this murmur, as a presystolic murmur, has made its way very slowly, a fact remarkable in view of its distinctive characters. Even now, after more than forty years, it is by many not distinguished clinically from the mitral regurgitant murmur. It was described by the writer of this article in his treatise on the diseases of the heart, in

1859. Prior to this date, no American author had described it. A clear understanding of it by British physicians, according to the author of a late work on diseases of the heart, dates from a paper in 1861, by Dr. Gairdner. Although not recognized as such by all, its individuality is too fully established to require any discussion.

In the opinion of the writer of this article, two other mitral murmurs are to be added to the two just named. One of these was described by him in his treatise on diseases of the heart, in 1859. This is a systolic murmur, in most instances, probably, involving chiefly the mitral curtains, but produced without mitral incompetence. If there be no incompetence, mitral regurgitation cannot, of course, take place; hence, the murmur is not a mitral regurgitant murmur. It was designated a mitral systolic non-regurgitant murmur, and, also, an intraventricular murmur. The grounds for reckoning this as a distinct murmur will be presently considered.

Another mitral murmur has been noticed in several works, and the writer is unable to attribute to any one the credit of having first described it as an individual murmur. It is produced by the current of blood from the auricle to the ventricle prior to the auricular contraction. It is a mitral direct, but not a presystolic, murmur. In point of time it is diastolic, and the name mitral diastolic murmur is an appropriate designation of it. The grounds for considering this as a distinct murmur will be stated later on.

There are thus four mitral murmurs, namely, (1) the systolic regurgitant, (2) the systolic non-regurgitant or intraventricular, (3) the presystolic, and (4) the diastolic. Each of these four murmurs has distinctive characters which individualize it. Two, three, and even all four may be combined in the same case. This statement, as will be seen, applies to the systolic regurgitant and to non-regurgitant murmurs. They are simply and explicitly designated. The names post-diastolic and post-systolic, proposed by Hayden, seem to the writer unnecessary refinements, and, therefore, objectionable. If the reader who has proceeded thus far would stop to reflect upon the inquiry whether the mitral murmurs offer topics for consideration and discussion of sufficient interest and importance to occupy the pages which are to follow, let him refer to that portion of the elaborate and able work on diseases of the heart, by Hayden, which treats of the cardiac murmurs. He will there find defects in our existing knowledge, together with differences of opinion in regard to the number of the mitral murmurs, their characters, their significance, and the modes of their production, which must convince him that they afford scope for an article extended much beyond the limits to which the writer will restrict himself. In fact, the object of the article is to present certain conclusions and suggestions without attempting to consider the subject comprehensively and fully.



It is a fact not to be lost sight of in the study of cardiac murmurs, as of all auscultatory signs, that knowledge of their significance must be based on clinical experience, embracing, under the name clinical experience, observations during life taken in connection with examinations after death. In cardiac, as in pulmonary, auscultation, it is not safe to trust to reasoning from principles of acoustics. It will not do to assume from the characters of certain sounds that certain physical causative conditions must exist, or from the existence of certain physical conditions that certain sounds must be produced. Hence, our knowledge of the significance of murmurs, as of other signs, is by no means dependent on our ability to explain satisfactorily the mechanism of their production. Differences of opinion in regard to explanations need not impair the value of signs in a clinical point of view. Undoubtedly, however, it is desirable to explain the mechanism of signs, and this is a legitimate object of study, bearing in mind constantly the fact that whatever knowledge may be obtained in this direction is subordinate to clinical experience.

There is a method of study with reference to the mechanism of the cardiac murmur which seems not to have been considered in proportion to its value. This method consists in reproducing, artificially, the known morbid physical conditions which underlie the murmurs. Much can be done in this way to elucidate and demonstrate the mechanism of pulmonary signs. For example, cavernous respiration may be produced by very simple artificial contrivances which represent faithfully the passage of air to and from pulmonary cavities. In like manner, the presystolic murmur may be imitated out of the body, and the mode of its production within the body illustrated. Here is a fruitful field for the study of cardiac murmurs by those who can combine mechanical ingenuity with the requisite clinical and pathological knowledge.

In order to seek for explanations of cardiac murmurs, and to devise experimental illustrations, it is not necessary to be profoundly conversant with the science of acoustics. Comparisons on a large and a small scale are at hand. The ocean, if not lashed into fury, is silent, except when its waves are broken by the shore or by rocks. A brook, with its bottom and borders smooth, flows silently, but it is murmuring when the current is interrupted. Coming nearer, in respect of magnitude, to the heart and bloodvessels, murmurs may be produced by forcing fluids into rubber tubes and bags of varying size. Valvular-like sounds are produced by forcible tension of pieces of linen or muslin held below the surface of a liquid. Musical notes may be caused by a stream of liquid acting upon a vibrating body in a closed cavity. It is perhaps not impossible by ingenious contrivances to represent artificially all the variations in intensity, pitch, and quality of the cardiac murmurs, together with the normal heart-sounds, and their abnormal modifications.

Returning to the four mitral murmurs, these are naturally divided into two groups, as follows: The mitral regurgitant, with the mitral non-regurgitant, or intraventricular murmur, form one group; and the mitral diastolic, with the mitral presystolic, form the other group. They will be considered as thus grouped in this article.

1. *The mitral regurgitant and the mitral non-regurgitant or intraventricular murmur.*

A systolic murmur having its maximum of intensity at or near the apex of the heart, transmitted in a horizontal direction to the left of this point, and heard near the lower angle of the scapula, associated with more or less enlargement of the heart, together with weakening of the aortic and accentuation of the pulmonic sound, is an unmistakable sign of mitral incompetence. On this point there is no room for discussion. In a practical point of view—that is, with reference to prognosis—it is important to bear in mind the fact that a very little regurgitation may give rise to a loud murmur; that mitral incompetence may be well tolerated for an indefinite period, and that life may continue for a quarter of a century or longer. These statements are based on cases under the writer's observation.

Let it be supposed that a systolic murmur is present, having its maximum of intensity at the apex, heard, perhaps, over the body of the heart, but not transmitted to the left, nor heard on the posterior aspect of the chest, and the heart not enlarged. There is no evidence that such a murmur is due to mitral regurgitation; the mitral valve may be perfectly competent. This is a mitral non-regurgitant or an intraventricular murmur. Such a murmur is the rule in a primary attack of rheumatic endocarditis, in chorea, in certain cases of anæmia, and sometimes when it has no apparent pathological connections.

A mitral non-regurgitant murmur may persist for a short or a long period and disappear, leaving behind no symptoms or signs of cardiac disease. The writer could cite from his records instances in proof of this statement. The fact is not easily explained if it be assumed, as is generally done, that such a murmur is evidence of mitral incompetence. While it is true, as has been stated, that mitral incompetence may be well tolerated indefinitely, it must be admitted that in not an inconsiderable proportion of cases the incompetence increases more or less rapidly, and results in enlargement of the right heart by dilatation, accompanied by dyspnoea, general dropsy, and ending in death. Hence is obvious the practical importance of the recognition of a mitral non-regurgitant murmur as a sign distinct from a regurgitant murmur. That the discrimination cannot always be made with positiveness, is to be conceded. A feeble murmur, although denoting regurgitation, may not be transmitted to the left, nor heard on the back. On the other hand, it is not certain that a non-regurgitant murmur is always limited to the præcordia, and never



heard on the posterior aspect of the chest. There may be exceptions to the rule, but the rule is not thereby invalidated.

The question will arise in the mind of the reader, How is an intraventricular non-regurgitant murmur to be explained? Here let it be remembered that a well-established clinical fact is none the less a fact because an explanation is not at hand. Autopsical proof of the correctness of an explanation is, of course, not practicable in the cases in which the murmur has existed and disappeared. Supposition must take the place of demonstration in such cases. This remark applies equally to the explanation generally adopted, to wit, that mitral regurgitation actually takes place, and is due either to a lesion from which recovery is complete, or to a functional incompetence from irregular contraction of the papillary muscles or other causes. Nothing can be more purely hypothetical than these suppositions. An explanation which refers the production of the murmur to different physical conditions within the ventricle is not more hypothetical, and it is vastly more rational. These conditions are doubtless varied. Professor Janeway has demonstrated the production of an intraventricular non-regurgitant murmur by a tendinous chord extending from a point within the left ventricle to a point on the opposite wall. In this case the patient had a persistent intraventricular murmur, and, death taking place from a disease having no connection with the heart, afforded the opportunity for the demonstration. Dr. Andrew H. Smith has suggested, as an occasional cause, friction of the mitral curtains upon each other when these are made tense by the ventricular systole.<sup>1</sup> The deposit of fibrin upon the ventricular aspect of the mitral curtains is an adequate explanation in cases of rheumatic endocarditis, and it is a probable supposition that this occurs in chorea and when under other circumstances an intraventricular murmur is developed. This seems a more rational supposition than that of a functional incompetence of the mitral valve. It is also a more rational supposition to attribute the murmur in certain cases to abnormal conditions of the blood. That an abnormal condition of the blood may alone suffice for the production of an intraventricular murmur, is certainly reasonable in view of the fact that such a condition produces murmurs in the arteries and veins. This analogical argument is strong, if not conclusive. It is, moreover, supported by the fact that an intraventricular murmur in cases of anæmia is generally accompanied by murmur in the aorta, the pulmonary artery, and the cervical veins.<sup>2</sup>

<sup>1</sup> New York Medical Record, April 18, 1885; and Journal of the American Medical Association, May 23, 1885.

<sup>2</sup> It is implied in these remarks that an intraventricular murmur referable to blood-changes is produced in the left ventricle. It may be that the seat of the murmur is, in some instances, within the right ventricle. Cases have been reported of a systolic mitral murmur, occurring in connection with pulmonary disease, in which no appreciable lesion at the mitral orifice was found after death. In a case under the writer's observation, of capillary bronchitis, mitral lesions were inferred from a loud systolic

A topic connected with the symptoms of functional mitral incompetence claims a passing notice. The frequency of hæmic murmurs at the base of the heart, and especially emanating from the pulmonary artery, in cases of general anæmia or spanæmia, is well known. It has been conjectured that the murmur usually referred to the pulmonary artery is in fact a mitral regurgitant murmur transmitted into the second intercostal space on the left side by the mitral regurgitant current. This supposition has been elaborately advocated by Balfour, and as elaborately controverted in a more recent and able work by Bramwell. It seems hardly to deserve the space given to it by the last-named author, inasmuch as it involves assumptions which are purely gratuitous and irrational. These are, 1st. That the murmur is not heard at the point nearest to the site of the pulmonary artery. This may be true in some, but certainly not in all, instances. It is equally true that an aortic direct murmur due to aortic lesions, and an aortic regurgitant murmur, do not always have their maximum intensity at a point nearest to the seat of their production.<sup>1</sup> 2d. That functional incompetence of the mitral valve takes place. This is purely hypothetical and improbable. 3d. That, assuming functional incompetence of the mitral valve, the regurgitant murmur has its maximum of intensity at the base; whereas, when incompetence is the result of lesions, as is well known, the maximum of intensity is at the apex. A conjecture so purely fanciful, without a single fact to support it, calls for no more than a passing notice.

An intraventricular and a regurgitant mitral murmur may be combined. Every auscultator of much experience must have met with a systolic murmur consisting of two parts differing in quality or pitch—one part rough and the other soft, or one part low and the other high pitched. The rational explanation is that there are two murmurs, one produced within the ventricle and the other at the mitral orifice.

2. *The mitral presystolic and the mitral diastolic murmur.*

The mitral presystolic murmur has usually a peculiar quality, and this, taken in connection with the time of its occurrence—beginning after the second and ending with the first sound—renders this murmur of all the cardiac murmurs the most easily recognized when its distinctive characters have been clearly apprehended and verified. It is,

murmur, and the heart was found after death free from any evidence of disease. It is a question whether in such instances the murmur be not a tricuspid regurgitant (functional) instead of a non-regurgitant murmur.

<sup>1</sup> A careful observer, Dr. F. C. Shattuck, in an article on "functional murmurs," in the *Boston Medical and Surgical Journal*, July 12, 1883, says: "Balfour finds the murmur of anæmia, as a rule, loudest an inch and a half to the left of the sternal border in the second interspace over the seat of the left auricle. Since I became acquainted with his writings I have examined many cases with reference to this point, and my experience coincides with the almost universal teaching that the point of maximum intensity is usually just to the left of the sternum in the second interspace, or over the third left costal cartilage."

however, to be remarked that the peculiar quality is sometimes wanting, and the recognition must then be based on the presystolic time of its occurrence and its localization at the apex.

What is the explanation of this peculiar quality? The writer has answered this question to his own satisfaction, but the answer has apparently either failed to receive attention from others, or it is not as satisfactory as to himself. That the murmur is produced by vibration of the mitral curtains, caused by the mitral direct current of blood forced by the auricular contraction through a narrow aperture, is shown, *first*, by the character of the murmur. The terms vibratory or blubbery express this character. *Second*, the murmur may be imitated perfectly by the expired breath in two ways. One way is to have the lips in contact and allow them passively to vibrate with the current of air in expiration. The other way is to allow the tongue to vibrate with an expiratory current of air. These imitations illustrate not only the character of the murmur, but the mechanism of its production. *Third*, the murmur may be represented artificially, as follows: Take an India-rubber bag, with very thin walls, of the size of an orange—such an one as is used, when inflated, to make the toy balloon; insert into the opening the efferent tube of a Davidson (Higginson) syringe; make an opening into the opposite end of the bag, of the size and form of a buttonhole; place the bag in a basin of water below the surface; force water through the bag by compressing the bulb of the syringe, and listen with the binaural stethoscope, the pectoral extremity just below the surface of the liquid. Here are precisely the conditions under which this murmur is produced in cases of mitral stenosis.

Clinical observation shows that, as a rule, when this murmur exists with the characteristic quality just referred to, mitral stenosis is produced by adhesion to each other of the mitral curtains, these forming a funnel-shaped space with the so-called buttonhole opening, the curtains not having been made rigid by thickening or calcification. If these conditions be wanting, either the presystolic murmur is not present, or, if present, the vibratory or blubbery character which in most instances is so highly distinctive of it is wanting; the murmur is blowing or bellows-like. It is a clinical fact that a presystolic murmur is not always present in cases of mitral stenosis, and that, when present, it may be a soft, bellows-like murmur. In these instances the conditions for the requisite vibrations of the mitral curtains are absent.

This explanation of the mechanism renders intelligible the disappearance of the murmur at times in an advanced stage of disease of the heart. The murmur requires for its production a certain degree of force in the auricular contractions; the force may be insufficient when from dilatation the muscular power of the auricle is notably weakened. The explanation renders intelligible the clinical fact that, when at times the



murmur has disappeared, it may be made to return by measures to increase the power of the heart's action, such as the administration of alcohol or digitalis.

That the presystolic murmur is due to the auricular contraction, is disputed by some able writers. They attribute the murmur to the ventricular systole, and account for its production by supposing that the murmur is produced after the ventricle begins to contract, and prior to the tension of the auriculo-ventricular valves. The murmur thus, according to this supposition, is intraventricular, and precedes the first sound, for the reason that this sound takes place at the end of the systole, when the auriculo-ventricular valves are made tense. An objection fatal to this supposition is, the presystolic murmur often occupies a longer time than the ventricular systole can possibly occupy. The murmur may be heard during the greater part, and even the whole of the long pause. It cannot be supposed that the ventricular systole is taking place during all this period. Vivisections show that the systole takes place quickly. It is unnecessary to cite other objections.

The not infrequent occurrence of a mitral presystolic murmur, unaccompanied by a mitral systolic murmur, is a noteworthy fact, as showing that the physical conditions for the former do not necessarily involve mitral incompetence. Under these circumstances it is almost certain that the mitral stenosis is caused by adhesion of the valvular curtains to each other, forming a funnel-shaped cavity, the flexibility of the curtains not being impaired. This fact, therefore, speaks for the explanation which has been given of the presystolic murmur, namely, vibration of the mitral curtains. Another fact having the same significance, is the intensity of the mitral valvular sound. This sound is in some cases notably more intense than when the valvular curtains are normal. Every auscultator of experience must have noticed the intensity of the mitral valvular sound at the abrupt termination of the murmur. It is intelligible that the funnel-shaped sac within the ventricle, under the pressure of the blood, should yield a louder sound with the ventricular systole than the mitral curtains in their normal condition. Normally the curtains are floated out and brought into apposition by the filling of the ventricle at the time of the systole. Their range of movement with the systole is less than when they are united to form a cul-de-sac, and, hence, the sound is less intense.

Another noteworthy fact is the long tolerance of the form of mitral stenosis of which the characteristic presystolic murmur is the sign. In several cases under the writer's observation, this lesion has been well tolerated for from ten to fifteen years, the sign having doubtless existed for a greater or less period prior to the cases' coming under observation. In a patient now living and free from any of the grave consequences of obstruction of the mitral orifice, a loud blubbery murmur was ascer-

tained to exist by the writer fifteen years ago. The long tolerance of the lesion, in certain cases, is an important fact to be borne in mind with reference to prognosis. Still another fact to be noted is the existence, not very infrequently, of this lesion when it cannot be traced to an attack of rheumatic fever—that is, in persons who have never had the latter disease. This fact renders it probable that endocarditis occurs oftener than is generally supposed as a complication of other diseases than rheumatism, or as a primary affection.

The author of a late work on diseases of the heart states that a constriction of the auriculo-ventricular opening is always present when a presystolic murmur exists. This statement expresses the prevailing opinion at the present time. That this opinion is erroneous, the writer of this article not only believes, but knows. This strong statement is made for the reason that his knowledge is based on recorded clinical observations during life, and post-mortem examinations in cases in which the murmur existed and the mitral valve was sound.

The first of these cases was observed in May, 1860. The case is very fully recorded. A murmur described in the record as presystolic and blubbery existed at the apex. There was no systolic murmur. A soft diastolic murmur was heard at the base and transmitted downward on the right side of the sternum as low as the xiphoid cartilage. There was no aortic direct murmur. The apex beat was in the seventh intercostal space, on the line of the nipple. Strong impulses were felt in the sixth and fifth intercostal spaces, together with heaving of the sixth and seventh ribs. The carotid, temporal, and brachial arteries pulsated visibly. The veins of the neck were distended, but there was no jugular pulsation. Based on these data, the recorded diagnosis was a button-hole mitral contraction, aortic insufficiency, and hypertrophic enlargement of the heart. The patient, who was fifty-six years of age, died suddenly in his chair. The following is the recorded account of the examination of the heart after death: "The organ weighed sixteen ounces; its circumference at the widest part, over ten and three-fifths inches. About two inches of the aorta were brought away with the heart. This portion was opaque, and roughened by atheroma, but there was no calcification. The artery measured, on a level with the upper margins of the valvular segments, four inches; the pulmonary artery measured three and a half inches. The aortic valvular segments were sound, but evidently insufficient from enlargement of the orifice. The walls of the left ventricle were thickened, measuring at the thickest part four-fifths of an inch. The muscular structure appeared healthy. The mitral valve presented nothing abnormal, except a few small vegetations at the base of the curtains on the auricular aspect. There was no adhesion of the curtains." The heart was exhibited at a meeting of the New York Pathological Society.



The second case was observed in the Charity Hospital, New Orleans, in February, 1861. This, together with the former case, was reported in *The American Journal of the Medical Sciences* for July, 1862. The report is quoted as follows: "I was requested to determine the murmurs in a case at the Charity Hospital, New Orleans. I found an aortic direct and an aortic regurgitant murmur, both murmurs being well marked. There was also a distinct presystolic murmur of the apex, having the blubbering character. On examination after death the aorta was dilated and roughened with atheromatous and calcareous deposit. The aortic segments were contracted and evidently insufficient. The mitral curtains presented no lesion; the mitral orifice was neither contracted nor dilated, and the valve was evidently sufficient. The heart was considerably enlarged, weighing seventeen and a half ounces, and the walls of the left ventricle were an inch in thickness."

A third case was observed in Bellevue Hospital in the autumn of 1882. An account of this case is given in an abstract of a clinical lecture published in the *Lancet* for January 27, 1883. In this case an aortic direct and an aortic regurgitant murmur existed at the base, and at the apex a mitral presystolic murmur associated with a mitral systolic murmur. The presystolic murmur had its usual vibratory or blubbering characters well marked. The case served to illustrate the differential characters of the mitral systolic and presystolic murmurs to clinical classes. The presystolic murmur at different examinations was found to vary in loudness, but it was never absent. Mr. A. P. Gould, of London, who happened to visit the ward with me the day before the sudden death of the patient, listened to the heart as affording a good example of the presystolic murmur. The heart was exhibited in connection with the lecture. It was considerably enlarged, the weight being seventeen and a half ounces. The enlargement was chiefly of the left ventricle. The sigmoid valves of the aorta were thickened and contracted, evidently allowing considerable regurgitation. The orifices of the coronary arteries were much contracted; the mitral curtains were perfectly normal; and the water test showed their competency.

On the basis of these three cases, to assert positive knowledge of the fact that a mitral presystolic murmur may be produced without mitral lesion, does not appear to the writer to imply undue assurance. It is an easy way, putting aside fairness and courtesy, to dispose of these cases, as one author has done, by charging the observer with inability to recognize a presystolic murmur.<sup>1</sup> Inasmuch as this charge has been met in another article (*Lancet*, March 8, 1884), it is only referred to here, adding, however, that the accusation of the error of having mistaken

<sup>1</sup> *Vide* Clinical Lectures on Diseases of the Heart, by George William Balfour, 2d edition, pages 116 and 165

an aortic diastolic for a mitral presystolic murmur, in these cases, is rendered absurd by the fact that in each case an aortic diastolic murmur was noted, distinct in character, as well as in rhythm, from the presystolic murmur. When the accuser has observed as many cases of a presystolic murmur as the writer, with the opportunity of comparing clinical observations with post-mortem examinations, he will, perhaps, be able to report some instances in which this murmur is unaccompanied by mitral lesion.

The difficulty of explaining why, as a rare occurrence, a mitral presystolic murmur without mitral lesion accompanies incompetence of the aortic valve, does not do away with the clinical fact. The writer has submitted an explanation which he will here introduce. He admits, however, fully the force of the objection which has been raised to the explanation by Hayden and Bramwell, to wit, that accepting the explanation, it would be expected, *a priori*, that the murmur should not rarely, but frequently, accompany aortic regurgitation, and should occur even without any lesion of the aortic valve. The explanation which he has given, quoting his own words, is as follows: "The explanation involves a point connected with the physiological action of the auricular valves. Experiments show that where the ventricles are filled with a liquid, the valvular curtains are floated away from the ventricular walls, and, approximating to each other, they tend to close the auricular orifice. In fact, as first shown by Baumgarten and Hamernik, a forcible injection of liquid into the left ventricle through the auricular opening, will cause a complete closure of this opening by the coaptation of the mitral curtains, so that these authors contend that the mitral closure of the auricular orifices is effected, not by the contraction of the ventricles, but by the forcible current of blood propelled into the ventricles by the auricles. However this may be, that the mitral curtains are floated out and brought into apposition to each other by simply filling the ventricular cavity with a liquid, is a fact sufficiently established and easily verified. Now, in cases of considerable aortic insufficiency, the left ventricle is rapidly filled with blood flowing back from the aorta, as well downward from the auricle, before the auricular contraction takes place. The distention of the ventricle is such that the mitral curtains are brought into coaptation, and when the auricular contraction takes place, the mitral direct current passing between the curtains thus in contact with each other throws them into vibration, and gives rise to the characteristic blubbery murmur."

The validity of this explanation, of course, involves the correctness of the explanation of the mechanism of the murmur in cases of mitral stenosis, namely, the retraction of the flexible curtains united at their sides, forming a funnel-shaped sac with a small buttonhole-shaped opening.

Dr. A. T. Keyt, distinguished for his observations in cardiography, has offered an interpretation of a presystolic murmur without mitral lesion, and an explanation of the mechanism of its production, which claim most respectful consideration. Dr. Keyt regards the writer's interpretation and explanation untenable, assuming the mitral curtains to be in apposition at the time of the auricular contraction, for the reason that the

"curtains would be limp and passive, and swayed noiselessly apart, as the blood under the auricular systole passed between them into the ventricle."

He refers the presystolic murmur to the aortic orifice, and gives what he conceives to be the true explanation, as follows :

"In the normal cardiac action the first sound of the heart is heard a notable time after the beginning of the ventricular systole. This is readily demonstrated by employing a cardiograph and a stethoscope at the same time, and giving attention to the play of the lever and the sound of the heart. It will be observed that the lever has nearly or quite completed its ascent when the first sound impresses the ear; the time of this ascent marks the interval between the beginning of the ventricular systole and event of the first sound. The interval is measurable, and may be stated roundly at about one-fifteenth of a second, which is long enough for a practised ear to appreciate." . . .  
 "When accepting the fact as set forth, that a cardiac murmur preceding the first sound may be audible in certain cases with healthy mitral but insufficient aortic valves, an explanation of the phenomenon is, that the murmur is systolic, and produced at the aortic orifice, and begins before the culmination of the first sound, because the blood is already flowing through the altered valves throwing them into vibration when the heart's note is heard."<sup>1</sup>

This explanation is ingenious. The objections to it are: 1st. The duration of the murmur is longer than the interval between the commencement of the ventricular systole and the first sound. 2d. The murmur has precisely the characters of the mitral presystolic murmur, when undoubtedly due to mitral lesion. This character is peculiar, and rarely, if ever, belongs to an aortic murmur. 3d. The presystolic murmur is limited to an area around the apex, and is not heard at the base of the heart, in this respect differing from an aortic murmur.

The mitral presystolic murmur referred to, for the most part, in this article, is characterized by a peculiar quality, which the writer has distinguished as vibratory or blubbering. It has been stated that this murmur always has this peculiar quality. This, however, is an error. A soft or bellows-like murmur heard at the apex, and presystolic in time, the latter point distinguishing it from an aortic regurgitant and a mitral diastolic murmur, can be no other than a presystolic murmur. Such a murmur is sometimes present in cases of mitral stenosis, the usual vibratory or blubbering murmur being absent.

The mitral diastolic murmur has not as yet gained general recognition as a distinct cardiac murmur. It is entitled to be so recognized. Within the past year the writer has met with several examples, a fact leading

<sup>1</sup> Boston Medical and Surgical Journal, July 12, 1883.

him to suppose that this murmur is not as rare as is supposed. In most of these examples the quality of the murmur has been soft or bellows-like. It has not had the faint musical character mentioned by Balfour, nor could the term *bruit de roulement*, applied to this murmur by Peter, be regarded as appropriate.

As regards its clinical recognition, a murmur which follows the second sound, and ends before the contraction of the auricle, if aortic and pulmonary regurgitation be excluded, may be assumed to be a mitral diastolic murmur. The localization of the murmur is an important diagnostic point. It is heard above the apex and below a horizontal line passing through the nipple. It is probably, with very rare exceptions, followed by a presystolic murmur. It may be distinguished from the latter by a difference in quality as well as in the time of its occurrence. It may, however, have the same character as the presystolic murmur. In some instances a murmur, vibratory or blubbery in character, may begin directly after the second sound of the heart, and continue throughout the long pause, ending with the first sound. In these instances the mitral diastolic and the presystolic murmur exist in combination. This combination also exists if a soft murmur occupies in the same way the long pause of the heart. It is easy to conceive of the mitral diastolic murmur's being overlooked, if it be soft and feeble, when associated with a loud presystolic murmur, especially if the former be not sought after. Moreover, a soft mitral diastolic murmur is liable to be regarded as an aortic regurgitant murmur. This error is probably not infrequent.

A mitral diastolic murmur must be produced by the current of blood from the auricle into the ventricle prior to the auricular contraction. It is intelligible that gravitation when the body is upright, and the *vis a tergo* incident to a distended auricle, give to this current a certain degree of force. If, as some contend, to this force were to be added aspiration caused by an active dilatation of the ventricle, it is surprising that a mitral diastolic murmur is not of frequent occurrence.<sup>1</sup> Here, however, as always in the study of physical signs, clinical observation should be the point of departure. The mitral diastolic murmur claims more attention, clinically, than it has hitherto received. There are points to be studied by observation, such as the frequency of the murmur, its association with other murmurs, and the conditions under which it is observed. A full explanation of the mechanism of its production, although interesting and important, must be secondary to clinical facts.

In conclusion, the following abstract of a case recorded twenty-three years ago is introduced as a probable example of a mitral diastolic murmur. The record of the case is headed "A New Cardiac Murmur."

<sup>1</sup> For a statement of the evidence of an active recoil of the ventricles, *vide* article by J. Lockhart Gibson, M.B., in *Lancet*, April 19, 1884.



"P. C., aged twenty, laborer, admitted into the Long Island College Hospital June 11, 1862. Rheumatism has existed for two weeks before his admission, but he has kept the bed only three or four days. The shoulder-joints, knees, wrists, and the small joints of the hands have been affected. He now has moderate febrile movement. He has a mitral presystolic murmur of the blubbery sort; also a systolic murmur in the left second intercostal space. The presystolic murmur has been made the subject of demonstration to the class in attendance."

"June 17, the presystolic murmur had disappeared. It existed up to the 16th inst. He has now a soft systolic murmur over the apex and body of the heart. Over and around the apex there is a murmur following the second sound, as if the sound were reduplicated; but, instead of a reduplicated sound, it is a rough, short murmur, and it is not at or near the base of the heart. I am at a loss to explain this sign. It follows the second sound after about the same interval as exists between the first and second sound. It is neither diastolic nor presystolic, but occurs at an intermediate period."

"The systolic murmur at the left second interspace continues, and is limited to this space. It is not heard in the right second interspace, and not over the carotid, although in the latter direction the two heart-sounds are distinctly heard. The apex beat is in the sixth intercostal space. He has now no affection of any of the joints, except stiffness. He was up and dressed yesterday, and is so to-day."

"June 20, I have again to-day verified the murmur described above as resembling, in the time of its occurrence, a reduplicated second sound. Its character is that of a murmur, and it resembles the usual mitral presystolic murmur. The order of its occurrence is as follows: First, the first sound of the heart; next, the second sound; and then the murmur; a distinct interval occurring between the murmur and the following first sound. This murmur is limited to a small area around the apex beat. These points are verified by my clinical assistant, Dr. Shiverick."

Seven years afterward, May 19, 1869, the following note was added to the record of this case: "I regard the new murmur described in the foregoing record as a mitral direct murmur, not continuing into the first sound of the heart."

According to the opinion thus expressed, the murmur was a mitral diastolic, as distinguished from a mitral presystolic murmur. If this opinion be correct, the case afforded an example of a rough mitral diastolic murmur, together with a presystolic murmur, the latter disappearing and the former persisting. It is not easy to understand how a murmur of that character could be produced by the current of blood from the auricle to the ventricle prior to the contraction of the ventricle, and a murmur not be produced by the current during the auricular contraction. Assuming, moreover, the correctness of the clinical observation and the interpretation, there must be an adequate explanation, of course, albeit the writer has not a satisfactory one to offer.

## IMPERFECT SYMMETRY.

BY SIR JAMES PAGET, BART., F.R.S.,

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FEW things in nature appear more constant and exact than that symmetry of organic form which is shown in the likeness of the several members of each two or more corresponding and similarly useful parts. The example nearest to each of us is the symmetry of the two side-halves of his own body; it usually appears perfect. And, so far as it can be tested by chemical analysis or by the much more delicate indication of symmetrical diseases, there is a symmetry of composition as well as of shape and visible structure. In substance as in form and size, the two halves appear exactly alike.

And yet it is probable that their symmetry is never quite perfect; never mathematically true. I think that any one who will carefully compare the two or more similar component parts of himself, or of any animal or plant, or any bilateral organ of either, will find, within the general likeness, some unlikeness of size or form, of texture or color, or of all these together. Certainly it is so in the two lateral halves of our own bodies. Just as between parents and offsprings the likeness is general and constant, but never perfect, so is it between the halves of each individual. Invariably nature varies.

The phenomena of symmetrical disease, to which attention was drawn many years ago by Dr. William Budd and myself,<sup>1</sup> are now carefully studied by many; but those of the modifications of disease associated with the defects of symmetry need study too. I have constantly observed them during many years; but, I am ashamed to say, have made no exact records of them, and can, therefore, do little more than suggest some of the lines of study which may yield to others better results than I have gained. The study should include the defects of symmetry or similarity not only of size and shape, but of composition and of rates and methods of development, degeneration, and disease. These are too often dismissed from study when they are called "exceptional cases;" a mischievous phrase if it be deemed explanatory; for I suppose that an "exception" to one rule is only an example of another rule which is as yet unknown.

One of the parts in which defects of symmetry may be most easily seen is the face. Artists know well that the two halves of a face are

<sup>1</sup> Med -Chir. Trans., vol. xxv., 1842. I do not know who first observed any of them; but one, at least, was painted by that most keen observer of natural forms and expressions, William Hogarth. In his great picture of the Pool of Bethesda, at St. Bartholomew's Hospital, he has represented a woman with symmetrical psoriasis; and not only a bilateral symmetry of eruption but an antero-posterior symmetry of similar patches on both knees and elbows.

very rarely alike. One with the largest experience told me that he had not seen such exact likeness in more than one face in a thousand; another that he had only seen it in "some stupid beauties." Certainly, the defect of symmetry is consistent with remarkable beauty. There is an extreme example of both in the lovely face of St. Mary, of Egypt, by Ribera (Spagnoletto), in the Dresden Gallery.<sup>1</sup> The left side of the face is much smaller than the right and more oblique in its inclination from the median line; the contrast may be observed in any of the numerous photographs of this portion of the picture which are published; but I think that both in these, and, generally, in photographs, the unlikeness of the two sides is less evident than in the faces themselves; perhaps, because of their showing imperfectly the difference of obliquity or of the angles at which the sides recede from the middle.

There is, I think, not much of pathological interest in the defects of symmetry of the head and face; unless in those examples in which there is great inequality between the sides of the skull and a rotation as if it were turned round on the vertical axis. But the defects should be noted; for they often, though not always, correspond with others in the trunk and limbs, and they may help to the understanding of these. They are best seen in the inequality of level and the difference of curves in the eyebrows; in the different degrees of openness of the eyelids, so that the eyes appear of unequal size, whether they be so or not; in the deflection of the antero-posterior plane of the nose; the unequal size and level of the nostrils; the inexactly horizontal line of the closed lips; the difference of the lines at which the two halves of the lower jaw rise from the chin; the difference of the planes of the two sides of the face; the inequality of total size in the two almost equal halves.<sup>2</sup>

All these deviations from general symmetry may commonly be seen; and as often in the most as in the least beautiful faces; and many of them become more marked in smiling, laughing, and other emotional movements.<sup>3</sup> But they have little interest in practice; unless it be in the case of the crooked nasal septum often making it hard to breathe through one nostril and sometimes making a face strange enough to make its owner wish for improvement.<sup>4</sup>

Inequalities of the neck often correspond with those of the face, and are well marked in the sterno-mastoid muscles and the parts near them.

<sup>1</sup> It was no doubt painted from a living model; for the same face is in a picture by the same artist in the Madrid Gallery. But here it is given to another saint.

<sup>2</sup> Imperfect symmetry is usual and very marked in the teeth; but I have not observed them enough to describe them.

<sup>3</sup> The vaso-motor nerve influences by emotions may be similarly unsymmetrical. I saw a girl who blushed on only the left side of her face and neck, and her mother told me that she herself used to do so. The ruddy blotches at the borders of full blushes are seldom similar on the two sides.

<sup>4</sup> I have an impression that these deviations from symmetry are most marked in the most cultivated intellectual races; and more than an impression that, when we reckon among them the variations of colors, the deviations are much greater in domesticated than in wild animals.

The clavicles are often unequal and unlike; but they seldom attract attention, unless when the sternal end of one is larger and higher than that of the other. This is sometimes thought a deformity, and appears the more so when it is associated with more than usual mobility; but, so far as I know, it is unalterable and harmless.

It is difficult to tell in chests which are unlike in their two halves how much is due to unequal respiration in infancy and early life, or to disease, or rickets, or other really morbid conditions. But it is common to see imperfect symmetry even where there is no good reason to suspect any of these causes of it; and it is usually shown in one or both of two ways. In one, the one side, usually the right, is visibly larger than the other. (I say "visibly," because these differences are measurable by a practised eye better than by any instrument used by unpractised hands.) In the other, the chest appears as if slightly rotated on the spine. In both cases there is an appearance which alarms mothers too watchful of their daughters' backs; the scapula on the larger side, or on the side rotated backwards, is more prominent than the other, and curvature of the spine is feared. If the dorsal spinous processes be duly median, showing that the spine is not rotated, though the chest may be, the fear is unfounded.

The appearance of dissimilarity in the two sides of the chest is often increased, especially in girls and women, by greater dissimilarity between the breasts. They are, indeed, very rarely symmetrical in either size, level, shape, utility for nursing, or liability to disease. They are, as truly as any other organs, a pair, yet are they never just alike.

The inequalities of the limbs have been so fully studied that I need only refer to the papers by Dr. Garson, in the *Journal of Physiology*, and to those which he quotes. He shows clearly that the two corresponding limbs are very seldom of the same length; and he proves this by numerous accurate measurements, not only of the whole length, but of the several parts of each. His measurements were made on skeletons, and are more accurate than are any possible in the living body. Yet during life, and in practice, notable differences may be clearly seen and need be well observed.

Difference of volume is often as marked as is that of length, and it is sometimes sufficient to suggest suspicion of disease. But the suspicion may generally be dispelled on finding that there neither is now nor ever has been any other sign of disease in either limb, and that it is difficult to say which of the two unequal limbs is the better or the more appropriate to the other parts of the body.

The difference of length has usually more importance in practice; for it may be associated with appearances of deformity resembling those which are due to really morbid shortenings of a limb, such as may ensue in the defective growths during infantile paralysis, or disease of the hip



or knee, or any similar affection. Many cases of suspected slight curvature of the spine are only examples of the adjustment due to inequality of the lower limbs, and in every such case they should be measured and compared; for the remedy may be supplied by boot soles of different thicknesses better than by spinal instruments. And I think that any one accustomed to estimate horizontal lines and lines drawn at right angles, will make the necessary measures best if, while the body is upright, or as nearly so as it can be, he will observe, while behind the patient, whether his hands resting on the upper borders of the iliac crests are in an exactly horizontal plane. If they are, a well-formed spine will stand at a right angle on that plane.

These examples may suffice to indicate that many much more useful facts than I have told may be collected in accurate records of the inequality of size and shape between the apparently similar pair-organs of the body. And many more may be found in observations of the defective symmetry in composition in the two apparently similar parts on the two sides.

They may commonly be seen in the symmetrical diseases of the skin. The patches of diseases are often not exactly alike on the two sides. Even in the parasitic affection of the epidermis in pityriasis versicolor, the general symmetry of which may be taken as clear evidence of a dependence of symmetry on identity of composition, the spots are not always alike in size and shape. Similar diversities may be seen in psoriasis; and in this there are often noticeable differences of time in the eruptions, that of one side preceding by a day or two that on the other. It is easy to speak of such things as due to chance; it might be right to do so if chance were a form of energy; it will be better to think of them as things of which useful observation may learn the meaning. I cannot explain them; I can tell scarcely more than that these differences in the methods of organic life do not always correspond with differences of shape and size. I know a case in which sweating, whether in health or in disease, is profusely greater on the left side than on the right; the patient is inclined to be left-handed, but the two sides are rather less than usually unlike in size and shape.

THE PRODUCTION OF THE  
SO-CALLED "ROSE COLD" BY MEANS OF AN ARTIFICIAL ROSE,

WITH REMARKS AND HISTORICAL NOTES.

BY JOHN NOLAND MACKENZIE, M.D.,

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THE simple untravelled Norwegian, so goes the story, when first brought into the presence of roses, feared to touch them, lest he should thereby burn his fingers. His inexperienced mind was filled with wonder that "trees" should bring forth flames and blossoms of fire, while he held up his hands for warmth before the objects with which he dared not come into contact.

This legend of the North may perhaps find its application in the following case, which, among its many other interesting features, forcibly illustrates the rôle of purely psychical impressions in awakening the paroxysms of the disease familiarly known as "rose cold:"

Mrs. —, thirty-two years of age, in excellent circumstances, surrounded by all the comforts of life; very stout, well nourished, but physically weak; five feet high, with light hair, brown eyes, and fair complexion; nervous temperament. Married for fifteen years, she is the mother of only one child, born three years after marriage. Laceration of the womb occurred during childbirth, and as the result of this accident she suffered from flooding at the menstrual period until two years ago, when an operation was performed on the womb, from which she obtained permanent relief. She volunteered the information, that her uterine trouble had greatly aggravated the head affection, and seemed to increase the severity of the asthmatic attacks. She has always resided in Baltimore. The general temperament of the members of her family is nervous; her father's sister suffers from asthma, and her own sister (a child) from periodic "influenza." In childhood, had scarlet fever, measles, and chicken-pox; in adult life, has been subject to sick headache and neuralgia. From infancy has suffered repeatedly from coryza of unusual severity.

She dates the origin of her present trouble from some time between the sixth and eighth year of life. The asthmatic feature of the case developed subsequently, the first attack appearing at the age of twelve, and since then the disease has been growing progressively worse every year. For fifteen years her sufferings have been intense.

The clinical history of this case is typical. About the latter part of May or the first of June, the disease commences as a coryza. For several days prior to its onset she suffers from an indefinite sense of general depression with a disagreeable feeling of heaviness in the head, which she in part attributes to the worry incident to expectation of the attack. The catarrhal symptoms may or may not be preceded by chilly sensations and general malaise. Their early or late appearance seemingly depends upon the condition of the atmosphere, as regards heat and moisture, and sudden and repeated fluctuations in the thermometer. A

thunderstorm invariably brings on an attack, without regard to season. The catarrhal stage commences with profuse watery discharge from the nostrils, increased lachrymation with redness of the conjunctiva, itching of the puncta, and photophobia. To these are soon added œdematous swelling of the lids, chemosis, and disturbances of vision, which prevent the use of the eyes for reading, sewing, and the like. The nostrils become at once obstructed, the nose itches violently, and paroxysms of sneezing, lasting sometimes for an hour at a time, occur at frequent intervals. The exterior of the nose becomes intensely red, and toward the close of the stage the cuticle desquamates. There is nearly always present a short, hacking, dry, harassing cough, which is relieved by sternutation. With the obstruction of the nostrils, the severity of the symptoms is increased; there is an annoying tickling sensation in the throat, which the patient feels "she must tear out with her nails;" the voice becomes husky, nasal, and easily fatigued; the pharynx feels dry and full, the ears become "stopped up," and not infrequently tinnitus forms a prominent symptom of the stage. The external auditory meatus is sometimes swollen, and the seat of intense itching; occasionally the tissues beneath and behind the auricle are perceptibly swollen. When the stage has reached its acme, there is associated with the above symptoms a *perceptible enlargement of the thyroid gland*, which may be regarded as of importance, in view of the probable vasomotor nature of the disease. To all these phenomena are added a general depression of the spirits and system, constant malaise, incapacity for mental work and household duties, and general irritability.

This state of affairs lasts, with occasional intermissions of comparative comfort, until from between the fifteenth to the twenty-fifth of August (generally the twentieth), when the asthmatic stage sets in. The symptoms detailed above become at this time more prominent, while the most distressing attacks of asthma are added to her sufferings. During the paroxysm it is impossible for her to breathe except in the erect posture. The attack of asthma appears daily, and always at night if she attempts to assume the recumbent position, and varies in duration from one to four or even five hours. During the attacks she is unable to leave the room, and is generally confined to bed.

During the month of September the paroxysms are most severe, but toward the end of the month gradually decrease in severity, and finally disappear. As a rule, she only suffers from the asthmatic feature in August and September; but occasionally the attacks are prolonged until Christmas. The appearance of frost puts a sudden stop to the disease. During the attack the temperature ranges between 100° F. and 105° F.

During her only pregnancy she did not have the disease; the child was born in July, and she did not suffer from her disease until the following October, when she had a slight attack of coryza and asthma. The child lived only five months.

The disease almost always breaks up with an attack of "malarial fever," which lasts for nine weeks, and sometimes for three months; as may be well imagined, the two leave her in a condition of great prostration, from which she slowly recovers. Her last attack was dissipated by a copious eruption of nettle-rash. It may also be mentioned, that during one of her paroxysms she became unconscious, and there was a general rigidity of the muscular system, followed by tremors, which



lasted for several moments, and then passed off. In one attack (the last) congestion of the lungs occurred, which rendered it the severest she had ever experienced.

The paroxysms are excited by the following agencies: (1) A heated, sultry condition of the atmosphere; (2) sudden changes in the temperature; (3) dampness; (4) exposure to "night air;" (5) electrical disturbances of the atmosphere. She can foretell by her sensations the coming of a thunderstorm, and when the latter approaches, the attack is unusually violent, causing her to seek refuge in a closed apartment, when she inhales the fumes of an antispasmodic preparation until the storm is over; (6) exposure to a high wind; (7) sudden excitement; (8) fright; (9) physical overexertion; (10) worry; (11) overloading the stomach: during her disease she has the most voracious appetite, which she is irresistibly compelled to gratify, and in so doing generally brings on a paroxysm; (12) the inhalation of common dust, cinders, and gases, especially those given off in the combustion of coal; (13) the presence or odor of strong perfumes, as, for example, articles of the toilet; the smell of tobacco smoke—anything, in fine, that has a pronounced or penetrating and heavy odor, as the tuberose, lily, etc.; (14) the presence or odor of hay and roses is especially active in exciting the attack. She cannot, for example, remain in a room where roses are kept, or wear them upon her person, without being seized with a violent paroxysm; nor can she come into close or remote contact with hay without the production of a similar result. Last summer, while on a visit to the country, she caught sight of a distant hayfield, when she was immediately seized with a coryza; and on several occasions while passing a haycart in the thoroughfares of the city was taken with an attack of asthma; (15) almost any stimulant, taken internally, such as brandy, whiskey, beer, etc.; (16) handling peaches; (17) the ingestion of fruit; quinia, and morphia.

As a rule, the disease rages with extreme violence only during the heated term—the summer months and September; but exposure to some of the exciting causes produces a modified form of the affection at other seasons of the year, and occasionally in the depth of winter. Occurring at these periods, it exhibits itself as a severe coryza, with slight embarrassment of the respiration, but which soon passes away, and leaves her as before. She never has a paroxysm in cold, frosty weather. During the interregnum of immunity she suffers, and has suffered for years, from a nasal and post-nasal catarrh. During the summer her attacks are aggravated at the menstrual period.

She has tried almost everything known to the profession and laity, including a host of quack specifics, for the relief of her trouble, but without making any impression upon her disease; has also spent several summers at a well-known "hay fever resort" without the slightest improvement in her condition. While on the water and by the seaside she is comparatively free from her trouble, which exhibits, moreover, no appreciable change after removal to the city from the country, and *vice versa*. The only medicinal agent from which she has ever derived comfort is a proprietary medicine composed of well-known antispasmodic drugs. Cocaine, exhibited in the most approved fashion, gives only temporary relief, lasting for half an hour, and leaving her, as a rule, worse off than she was before its application.

On June 1, 1885, she was brought to me, by Dr. Henry Salzer, of this



city, suffering from the symptoms of the first stage detailed above. Although complaining of intense itching in the larynx and ears, those organs were apparently perfectly healthy on inspection. The pharynx, too, presented nothing worthy of remark beyond a slight engorgement of one of the tonsils. The nasal pharynx contained a mass of thin glairy mucus, upon the removal of which the whole region, including the posterior nares and vault, was found in a state of intense redness; the nasal tissues were so swollen that they almost completely occluded the middle and inferior meatuses. Anteriorly, the same swelling and hyperæmia were observed, and the nostrils themselves were filled with a semifluid, glairy mucus. No anomaly of the face or nostrils could be discovered.

Irritation of the anterior segment of the nasal fossa with a probe caused great discomfort, with increase of lachrymation and conjunctival hyperæmia. Pushed further back into the fossa, a fit of severe sneezing and coughing was produced, which necessitated the immediate withdrawal of the instrument. Upon causing artificial contraction of the swollen turbinated tissues with cocaine, an enormous hypertrophic thickening of the right inferior turbinated body was discovered, which extended from its posterior extremity to within a short distance of its extreme anterior limit. In the left nostril there was apparently no well-defined hypertrophic condition. Physical examination of thoracic and abdominal organs negative.

She was placed upon gr.  $\frac{1}{16}$  of phosphide of zinc, combined with gr.  $\frac{1}{4}$  extract of *nux vomica*, before meals, and gtt. iij Fowler's solution of arsenic after meals, and was directed to use the following in spray twice daily: R.—*Acid. borac.* ʒj, *pot. bromid.* ʒj, *glycerin.* ʒss, *aquæ* ʒviij.—M. The galvanocautery was applied to the most sensitive spots in the nasal chambers on June 4, 6, 8, and 10. By June 15 great improvement in her condition had taken place. The breathing was not disturbed, the sense of smell and taste had returned, the conjunctivæ were normal, and she had experienced no itching about the eyes and nose for several days. She assured me that the cautery was the only thing that had ever given her permanent relief, and although the last application had caused her pain and no little discomfort, she insisted upon its reapplication, as the slight pain incident to the operation was more than compensated for by the permanent benefit she derived from its execution. About ten days later, she was practically free from the disease, suffered no discomfort, although she had been exposed in the meantime to several of the exciting causes of the paroxysms. She seemed confident, however, that if brought into contact with hay or roses she would have an attack, and had, therefore, rigidly excluded the latter from her home.

Decidedly sceptical as to the power of pollen to produce a paroxysm in her particular case, I practised the following deception upon her, which still further confirmed me in that belief. For the purpose of the experiment, I obtained an artificial rose of such exquisite workmanship that it presented a perfect counterfeit of the original. To exclude every possible error, each leaf was carefully wiped, so that not a single particle of foreign matter was secreted within the convolutions of the artificial flower. When the patient entered my consultation-room, she expressed herself as feeling unusually well. The evening before she had attempted

to wear some roses, but had been obliged to remove them from her dress, as they had produced a great deal of discomfort. Apart from this incident, she had been perfectly comfortable for several days and nights. Her conjunctivæ were normal, the nasal passages free, and there was nothing to indicate the presence of her trouble. She conversed with me for some time about her case and on general topics, speaking in the most encouraging manner concerning the progress she was apparently making toward recovery. I proceeded to remove the slight slough from the cautery operation, which lay loose in the nostril, and made an application to the mucous membrane, and all without exciting the slightest tendency to reflex movements. After I felt sure that such tendency was absent, I produced the artificial rose from behind a screen where it had been secreted, and, sitting before her, held it in my hand, at the same time continuing the conversation. In the course of a minute she said she felt that she must sneeze. This sensation was followed almost immediately by a tickling and intense itching in the back of the throat and at the end of the nose. The nasal passages, at the same time, became suddenly obstructed, and the voice assumed a hoarse, nasal tone. In less than two minutes the puncta lachrymalia began to itch violently, the right and afterward the left conjunctiva became intensely hyperæmic and photophobia and increased lachrymation supervened. To these symptoms were added, almost immediately, itching in the auditory meatuses and the secretion of a thin fluid in the previously dry nasal passages. In a few minutes the feeling of oppression in the chest began, with slight embarrassment of respiration. In other words, in the space of five minutes she was suffering from a severe coryza, the counterpart of that which the presence of natural roses invariably produced in her case. An examination of the throat and nasal passages was then made. The right nostril was completely obstructed by the swollen, reddened, irritable turbinated structures; the left was only slightly pervious to the air-current; both were filled with a serous-looking fluid. The mucous membrane of the throat was also injected, but did not exhibit the same amount of redness and irritability found in the nasal passages. As the discomfort was rapidly increasing, and as I considered the result of the experiment sufficiently satisfactory, I removed the rose and placed it in a distant part of the room. When told that the rose was an artificial one, her amazement was great, and her incredulity on the subject was only removed upon personal examination of the counterfeit flower. She left my office with a severe coryza, but also with the assurance that her disease was not altogether irremediable. A few days later, she called to see me again, and on that occasion she buried her nostrils in a large fragrant specimen of the genuine article and inhaled its pollen without the slightest tendency to the production of reflex acts.

**HISTORICAL REMARKS.**—The dependence of catarrh, coryza, asthma, syncope, convulsions, and a host of other phenomena upon the presence or odor of roses, lilies, peonies, and other flowers, has been recognized for centuries. For, although Pliny<sup>1</sup> informs us that the seed of the rose inhaled into the nostril has the effect of clearing the brain, there are many cases to be found among the older writers, in which the odor of various substances, such as the rose, has been known to result in epilepsy,<sup>2</sup> syncope, and even death,<sup>3</sup> and there is a tradition that the Roman ladies conceived an especial aversion to the odor of the queen of flowers.

In the light of our present knowledge of the affection known as "hay fever," it is scarcely conceivable that it made its first appearance at the beginning of the present century. As Dick, and afterward Matthew Baillie, thought that in describing their first cases of laryngitis they had

<sup>1</sup> Nat. Hist., lib. xxi. cap. 73. The same writer (lib. vii. cap. 7) also observes that the smell of a lamp which has been extinguished will often cause abortion, and that the latter ensues should the female happen to sneeze just after the sexual congress.

<sup>2</sup> The association of epileptiform seizures, or even true epilepsy, with some irritation in or about the nasal passages, or peculiar susceptibility on the part of certain individuals to be thrown into epileptic convulsions through the application of some forms of matter to the nasal mucous membrane, seems to have been familiar from the earliest times. We learn, for example, from Aretæus (*De causis acut. morborum*, lib. i. cap. 1, Ed. Boerhaave, Lugd. Bat., 1735) that the gagate stone (a species of hard coal or jet) was utilized by the ancients as a test for epilepsy, for when applied to the nostrils the sufferer was thrown into epileptiform convulsions. Pliny (lib. xxxvi. c. 34) also alludes to this test, and to the power of the smell arising from burning goat's horns or deer's antlers in accomplishing the same result (lib. xxviii. cap. 63). According to this historian, the secundines of a she-ass, placed under the nostrils of the patient when the fit is approaching, will effectually dispel it. It is also a curious historical fact that Avicenna (*Op. omn.*, Venet., 1608, lib. iii. Fen. i. tract v. cap. 8, p. 499) also mentions (l. c., Fen. 5, tract 2, cap. 15, p. 585) "*rosa cum suis pilis*" among the milder measures resorted to to provoke sternutation, and regarded sneezing itself as a mild form of epilepsy (*epilepsia levis*), and that a similar opinion was entertained long afterward by the learned Fernelius (*Medicina, Lutetiae Parisiorum*, 1554, de epilepsia). In the seventeenth century, Salmuth (*Observationum medicarum centuriæ tres posthumæ*, Brunsvigæ, 1648, cent. ii. obs. 13, p. 65, and obs. 60, p. 87) called attention to the fact that paroxysms of epilepsy are often resolved by the eruption of blood from the nose, and related a case of "periodic paralytic tremor," in a woman of 50, dependent probably on a subacute form of catarrh. Several centuries ago, it seems to have been an accepted fact that the odor of, or emanations from, certain plants, notably the rue (*ruta graveolens* and *ruta sylvestris*, Dioscorides, *Op. omn.*, Ed. Kühn, Lipsiæ, 1830, tom. ii. p. 515), are capable, when applied to the nose, of provoking epileptic attacks (Sylvester Rattray, in *Aditus novus ad occultus sympathiæ et antipathiæ causis inveniendus per principia philosophiæ naturalis*, etc., Tubingæ, 1660, p. 34); while Schenck, of Grafenberg, on the other hand (*Observat. medicæ de capite humano*, hoc est exempla capitis morborum, etc., Basiliæ, 1584, obs. cciv.—case from the practice of Balthazar Conradinus), refers to the case of a rustic who was delivered from epilepsy by the odor of the *ruta sylvestris*. This writer also reports an interesting case of great redness of the face, convulsions, phrenitis, tremors, and cold sweats, from a slight catarrh (*op. cit.*, obs. xcix.). Finally, Van Helmont (in *op. infra citat.*, p. 110, § 20) makes the broad assertion that certain odors are capable of provoking not only epilepsy, but headache, nausea, vomiting, cough, hiccup, vertigo, apoplexy, dysentery, and other affections; and Portal (*Cours d'Anatomie Médicale*, etc., Paris, 1804, tom. iv. art. *nez*, p. 491) observes that he has noticed pains, vertigo, and even epileptic affections in connection with disease of the nasal membrane, and refers to a case accidentally cured by the fumes of cinnabar, given with other intention.

<sup>3</sup> While there is a remote possibility that this observation of the ancients, which finds its reflection in the poetic imagery of Pope, may have some slight foundation in fact, it is extremely doubtful whether, in the cases referred to, death was due to the simple inhalation of the odoriferous particles of the flower, for in some of the recorded instances the victims were confined to closed chambers, and were possibly poisoned by the displacement of the oxygen of their bedrooms by the noxious exhalations from the plants. It should also be remembered that our less civilized and punctilious brother-man of a few centuries back, did not hesitate to dispose of an enemy through the covert instrumentality of poisoned flowers and other equally insidious devices, by means of which the deadly agent was introduced into the system through the respiratory mucous membrane.



discovered a new disease, so Bostock, in portraying the symptoms of "*Catarrhus æstivus*," was led into a similar error. For no one can arise from the perusal of the older writers on asthma without the conviction, or, at least, the suspicion, that this disease has descended to us through the centuries, as a species of the "convulsive asthma" and "periodic coryza" of the more ancient nosologists, who in their state of medical science did not resort to the nosological refinements which proceed from the more advanced pathological research of the present day and century.

As early as 1557, Amatus Lusitanus<sup>1</sup> related the case of a Dominican monk, who, whenever he perceived the odor of roses or saw them at a distance, was immediately seized with syncope and fell unconscious to the ground. Having consulted a physician, he was advised to remain within doors during the rose season, to avoid the disagreeable effects which they produced. The same writer alludes to other antipathies to the odor of cheese, etc. Amatus Lusitanus has been looked upon in some respects as an untrustworthy observer, but there is no reason why his reliability should be questioned in regard to this particular case, especially as Botal,<sup>2</sup> who wrote a few years later, states that he knew, not one, but *several*, in whom headache, sneezing, and itching of the nostrils lasting for the space of two days, were caused by the odor of roses.

In 1631, Johan Karl Rosenberg<sup>3</sup> published a philosophico-medical treatise on the natural history of roses and their uses in medicine, in which he referred especially to their occasional disagreeable effects upon the organs of olfaction. In the early part of the following century, the subject was again brought forward by Spigelius,<sup>4</sup> who alluded to the frequency of the antipathy to roses and mentions the celebrated and often quoted case of the Cardinal Oliver Caraffa. This writer also states that the fact of death from the odor of the rose has been sufficiently established by the writings of the ancient physicians.

The various "idiosyncrasies" in regard to olfaction were again referred to, and in the same year, by L. Sennert<sup>5</sup> and Panaroluss.<sup>6</sup> The latter bases his observations on the experience of Frascatorius and relates

<sup>1</sup> Curationum medicinalium cent. quatuor., Venetiis, 1557. Cent. II. cur. 36.

<sup>2</sup> Leonard Botal, Opera omnia, Lugduni, 1565 (vol. containing comment. duo., etc., de catarrho, de fungo strang., etc., p. 23). See also Schneider, *infra*.

<sup>3</sup> Rhodologia, seu philosophico-medica generosæ rosæ descriptio, Francofurti, 1631. My information concerning this book is derived from a review of it in the German Miscellanies of Natural Curiosities (Dec. II. Anno III. p. 578, Nürimbergæ, 1685). The older writers refer also to Cromer's History of Poland, to the "Gammarologia" of Sachsus, and to the work of Petrus Servius, "De Odoribus," for examples of accidents from the odor of roses; but neither these works nor the "Rhodologia" of Rosenberg are accessible to me.

<sup>4</sup> Isagogus in rem herbariam, libri duo., Lugd. Bat., 1633—Elzevir edition—lib. II. cap. xi. p. 181, and cap. 13, p. 186.

<sup>5</sup> Practicæ medicinæ, ed. 1654 (Vratislav. ?) lib. I. part II. cap. xxi.

<sup>6</sup> Iatroligismorum, seu medicinalium observationum pentecostæ quinque, etc. Hanovię, 1654 Part v. obs. 23, p. 158.



in addition a case of his own, in which the odor of sassafras gave rise to syncope, cold sweats, and general lividity of the surface, so that death seemed imminent. Treated of some years later by Johan Rhodius<sup>1</sup> and referred to by Paracelsus,<sup>2</sup> the antipathy of the nasal apparatus to the odor of roses was discussed at some length by Conrad Schneider<sup>3</sup> in his famous work, *De Catarrhis*.

In the same century, Van Helmont<sup>4</sup> in several chapters of his work discussed the effects of sweet odors in the production of headache, vomiting, epilepsy, and extreme difficulty of breathing (asthma). He also alludes to the fact that, while sweet odors give rise to asthma in some, in others they produce instead of asthma, hemicrania, palpitation, and syncope. This writer regards such disturbances as of frequent occurrence, and is looked upon by some<sup>5</sup> as the first to recognize the affection known as "hay asthma." He explains the mechanism of such attacks by the operation of the "Archeus," on the fantastic theory with which his name is inseparably associated in medical history. Two cases of probable rose cold were related toward the close of the seventeenth century by Binningerus<sup>6</sup> and his contemporary Ledelius,<sup>7</sup> and Pechlinus<sup>8</sup> reported the case of a pharmacist who was thrown into violent paroxysms from the odor of violets in his urine, and was only relieved upon the return of the natural odor to the excretion. The same writer relates another case in which a woman, having taken saffron for some menstrual trouble, was seized with coryza, headache, sneezing, and other annoying symptoms.<sup>9</sup> In the same year a most interesting observation was recorded by Constant de Rebecque,<sup>10</sup> who himself suffered for thirteen years from rose

<sup>1</sup> Observation medic. cent. III., Pataviæ, 1657, obs. 99.

<sup>2</sup> Opera Omnia—Genevæ, 1658, vol. I. tract II. cap. II. p. 711, b. It is interesting to note that Paracelsus adverts to the subject in his description of the *morbi metallici*.

<sup>3</sup> De Catarrhis, lib. V. cap. I. p. 127—Wittebergæ, 1662. A number of cases, some occurring under his own observation, others in the experience of Botal, Echtiuss, Tasso, Servius, and others, are related by Schneider, in which sneezing, pustules on the face, catarrh, syncope, epistaxis, and even death resulted from the inhalation of the perfume of roses. The so-called "hay asthma" of the present day may possibly be regarded as allied to, or included in the "suffocative catarrh" of Schneider (lib. V. cap. 4), in which the "membrane lining the nose and mouth, both before and behind, discharges a flux of serum, with which the mouth is constantly filled."

<sup>4</sup> Johan Baptist Van Helmont. Op. omnia, Francofurti, 1682. Imago Fermenti impregnat massam semine, p. 110, § 10, p. 344, § 10, and p. 348, § 41. This author also refers to the case of a monk, employed in pulling down buildings, who grew asthmatic from the constant inhalation of dust.

<sup>5</sup> Bergeron. Thèse d'agrégation, 1872, referred to by Louis Villemsens. Thèse de Paris, No. 494, 1872. Étude sur le cat. spasmodique d'été, etc.

<sup>6</sup> Johan Nicolai Binningerus. Observationes medicinal, cent. quinque, etc. Montbelgardi, 1673. Obs. 86, p. 227. I am indebted for this reference to the work of Dr. Morell Mackenzie—Hay Fever, etc., London, 1885. Third edition, p. 48.

<sup>7</sup> Miscellan. nat. cur., Dec. II. anno I. Obs. 140. This case is not infrequently referred to by the writers of the last century, and also by Phœbus (Der typische Frühsommer Katarrh, etc., Giessen, 1862), and Morell Mackenzie (op. cit.).

<sup>8</sup> Joh. Nicol. Pechlinus. Observationum physico-medicorum libri tres., etc. Hamburgi, 1691, lib. ii. obs. 50, p. 332.

<sup>9</sup> Op. cit., lib. i. obs. xli. pp. 94–96.

<sup>10</sup> This case is taken from the Atrium Medicinæ Helvetiorum (obs. 92, p. 15), published in Geneva in 1691, and is cited by Morell Mackenzie (op. cit.).

coryza, which he attributed, as we learn from Morell Mackenzie, to something which "flows from roses, which stings the nose, and by means of tiny prickles produces a solution of continuity imperceptible to the sight." Rebecque may, therefore, be looked upon in a certain sense as the father of the pollen theory.

In 1696, Dieterich Valentin Kramer<sup>1</sup> collected in an inaugural thesis a number of cases, among which appears the famous one related by Boyle of an English noble, who was so sensitive to the odor of roses that when they were placed near him while sleeping, pustules broke out over his cheek. Kramer also speaks of a physician whom he knew, who was made ill by the smell of roses, and discusses the effects produced by the odor of the lower animals, as cats, dogs, mice, etc., deriving most of his information on the subject from the work of Lemnius.

In 1710, Antoine Rudolph de Voisin<sup>2</sup> published a most careful compilation of cases from the writings of preceding observers, illustrative of the extraordinary effects of the odor of cheese (from Schoockius's "De aversione casei," Johan Faber, Rhodius, and Praevotius), sassafras, cinnamon, orange flowers, lilies (from Scaliger's *Exercitationes*), peonies (Lanzonus, Eph. nat. cur. Dec. II. ann. IX. p. 77), apples (from Bruyerinus's *De re cibariâ*), hyacinthe, amber, musk, saffron, strawberries, and that of different animals, as cats, dogs, mice, etc. De Voisin knew at Basle, a pharmacist "*qui toto illo tempore quo florentes rosæ in suâ officinâ ad varios usus præparantur, ex illarum odore continua fere coryza, non sine crebrâ sternutatione aut capitis etiam dolore, laborare solet.*"

In 1724, David Casper Roehner<sup>3</sup> still further elaborated the subjects handled by Kramer and De Voisin, and added a large number of isolated cases from the German Ephemerides of Natural Curiosities, and from the writings of Cromer, Rosenberg, Scaliger, Dolaëus, and others. This writer informs us that Louis XIV., of France, could not tolerate the smell of the rose. Two years later, Sir John Floyer<sup>4</sup> discussed the relation of the sense of smell to asthma, giving among the causes of the disease, the odor of the primrose. He attributes the difficulty of breathing, however, to irritation of the trachea by the odorous body. Floyer himself suffered "under the tyranny" of the disease for more than thirty years, and it is interesting to note that the origin of his trouble was a cold, contracted at school; that he never had it at Oxford, but when he went to Staffordshire into his "native air," he was usually visited with a fit or two. He was also more liable to return of his asthma during the month of August. This writer speaks of "an anniversary asthma" (p. 101), which a catarrh precedes and accompanies,

<sup>1</sup> Disputatio med. inaug. de idiosyncrasiis, Helmstadii, ii., 1696, § vii.

<sup>2</sup> Dissert. med. de antipathia humana, in Theodor Zvinger's "Fasciculus dissertationum medicarum selectorum," etc., Basiliæ, 1710, I.

<sup>3</sup> Dis. inaug. med. de corrigenda idiosyncrasia in stat. præterit. degenerante, Erfordiæ, 1724.

<sup>4</sup> A Treatise of the Asthma, London, 1726, p. 73.

and which terminates in much spitting. "It may be observed," says he, "if the asthmatic catch cold and have a rheum on the teeth, throat, or head, within a night or two the fit will follow," a fact which he explains on the supposition that "the effervescence which usually attends all catarrhs, pushes some slimy lymph on the lungs." He also relates the case of a boy who had asthma almost from his birth, contracted from a cold, which occasioned a great running at the nose and constant wheezing, and who died suddenly at the age of one year and a half, all medicines having failed to relieve him (p. 102).

In 1765 appeared a thoughtful treatise on nervous diseases by Robert Whyte,<sup>1</sup> of Edinburgh, in which he calls attention to the fact that "several delicate women, who could easily bear the smell of tobacco, have been thrown into fits by musk, ambergris, or a pale rose, which to most people are either grateful, or at least not disagreeable" (p. 125). He also mentions similar antipathies in regard to cinnamon and other substances. One year later, Daniel Wilhelm Triller, in his curious work,<sup>2</sup> dwelt upon the so-called idiosyncrasy of olfaction in regard to roses and violets, and related two cases—one of a noble bride, who sitting surrounded by roses, and weaving them into garlands, became suddenly prostrated, and falling into the arms of her attendant, who rushed to her assistance, was soon lifeless; the other (described at great length), the history of a case in which death occurred from the odor of violets in a closed chamber.

In the edition of his work on exhalations, etc., published in 1776,<sup>3</sup> Robert Boyle treated briefly of the accidents arising from the odor or presence of roses, and toward the close of the last century a number of dissertations appeared on idiosyncrasy in general, in which the antipathy of certain persons to roses is mentioned, and of which the pamphlet of Rahn<sup>4</sup> is the most complete and original.

<sup>1</sup> Observations on the Nature, Causes, and Cure of those Diseases which have been commonly called Nervous, Hypochondriac, and Hysterical. Second ed., Edinb., 1765, p. 125.

<sup>2</sup> Opuscula medica ac medico-philologica. Francofurti et Lipsiæ, 1766, vol. i. Diss. ix. p. 237 *et seq.*

<sup>3</sup> Exercitationes de atmospheris corporum consistentium; deque mira subtilitate, determinata natura ac insigni vi effluviurum. Lugd. Bat., 1776, cap. vi. p. 213 *et seq.*

<sup>4</sup> Exercitationum physicarum de causis physicis miræ illius, tum in homine, tum inter homines, tum denique inter cetera naturæ corpora sympathiæ secunda. Turici, 1788.

Those who wish to investigate the subject of idiosyncrasy in general and antipathies of olfaction in particular, may consult the subjoined list of essays and cases, which I have selected from a large number of dissertations, as containing the gist of all that is known concerning the subject. In them will be found many cases, collected from the ephemeral publications and works of writers of the sixteenth and seventeenth centuries, which illustrate the so-called idiosyncrasy of olfaction, and which have not been embodied in the text. The older literature of reflex phenomena dependent upon nasal disease has been given in the introduction to my essay on "Rhinitis Sympathetica." Bartholini (Historiarum anatomicariorum, cent. 3 and 4, Hafniæ, 1687, cent. 3, hist. 28); Salmuth (op. cit., circa); Herlinus (Bigæ remedium generosorum, sive de remediis sudoriferis, cum præmissis de sudore, etc., Lipsiæ, 1693. Disc. secundus, p. 22, discusses effects of odor of rose, amber, musk, etc.); Hünerwolff (Ephem. nat. cur. dec. ii. anno v. obs. 22, pp. 34-35. De catarrho ad nares ex rosarum odore—a famous case); Riedlin (Linnæ medicæ, anno 1695, 177, 178—*vide* Phœbus, op. cit.—case of rose-cold); Johann Samuel Eggers, Diss. med. inaug. de sensibilitate personali, Halæ Magdeburgiæ, 1730, p. 23); Abraham Kau Boerhaave (Impetum faciens dictum Hippocrati per corpus consentiens philologiæ et physio-



It will thus be seen, that the so-called "idiosyncrasy," by virtue of which the presence or odor of certain flowering plants is sufficient to create disturbances referable to the nasal chambers and other portions of the respiratory apparatus, was familiar at a remote period of medical history. In the days when medical writings were published in Latin, the necessity of recording one's observations in a foreign tongue led to a terseness of style and incompleteness of description which often surrounds with uncertainty the exact nature of the cases reported; but whether the records referred to were examples of true vasomotor coryza or not, they may be placed in the same category of affection, and the predisposing influences be considered identical with those provocative of the disease called in the present century "rose-cold."

IDENTITY OF "ROSE COLD" AND "HAY FEVER."—The so-called "hay fever" and "rose cold," may be regarded as the manifestations of a morbid process common to them both—as the grouping together of certain prominent symptoms of an affection for which I have suggested the name *rhinitis sympathetica*, and whose pathology has been discussed elsewhere. The history and conditions of development, the mechanism and symptoms of the paroxysm, are the same in both; and we may, therefore, look upon them as identical. The idea of identity, moreover, not only greatly simplifies the study of this class of affection, but also enables us to approach more nearly the scientific generalization of their phenomena. On the other hand, if we start out with the idea that the coryza excited by roses, or that excited by the emanations from other flowers and grasses, are separate affections, we shall have almost as many varieties of coryza as there are flowering plants in the vegetable kingdom. We should have to speak of daisy cold, pansy cold, violet cold, and so on to the end of the list.

The same thing applies to the nomenclature of the disease based on its assumed occurrence only during certain months of the year, and it were well, therefore, to discard the appellations "June cold," "August cold," etc., for starting on such a basis, we would have a different variety for at least one-half of the calendar months. The so-called June cold often first attacks the patient in August, and the coryza of the latter

logice illustratum, etc., Lugd. Bat., 1745); Johann Wolfgang Maniutius (Diss. med. inaug. de idiosyncrasia ex diversa solidorum, etc., Lugd. Bat., 1749—general discussion); Roose (Die Krankheiten der Gesunden, Göttingen, 1801); Jacob Davidsohn (De idiosyncrasia dis. inaug., Berolini, 1847); E. F. J. Passemont (Essai sur les antipathies, Thèse de Paris, 1811, No. 80); Wagner (Hufeland's Journal, Bd. 33, 1811, St. v. p. 55 *et seq.*—gives, among others, an interesting case of a young lady who was seized with sneezing every time she had the desire to go to stool); August Heinrich Roebbelen (Diss. inaug. med. de idiosyncrasiis, Göttingæ, 1818); Henning (Ideen über Idiosyncrasie, Antipathie u. Kränkliche Reizbarkeit, Stendat, 1812); Parreidt, F. H. (Nonnulla de idiosyncrasiis, Halæ, 1835—gives literature); C. B. Heinrich (De idios. diss. med., Bonnæ ad Rhenum, 1841—gives references to rare works); Orfila, Treatise on Poisons, etc., Am. ed., Boston, 1826—mentions pathological effects of the rose, pink, and honeysuckle, pp. 128, 129); Bosquillon's Case (*vide* Girard, Traité de l'Asthme sec et convulsif, Thèse de Paris, 1813. No. 142, p. 9—taken from Cullen's Nosology; also quoted by other writers); Dict. des Sciences Médicales, articles antipathie and idiosyncrasie (containing cases taken mostly from the writers already mentioned); Phœbus (op. cit.) and M. Mackenzie (op. cit.).



month not infrequently makes its first appearance in September or July. Indeed, there is often the greatest irregularity in the period of onset, and this irregularity I believe to be dependent not upon the flowering of plants, but upon certain thermometrical and barometrical conditions.

The more I inquire into the subject, the less importance I attach to the alleged influence of the pollen granule in the production of the paroxysms of the disease. It may be eminently attractive to suppose that the process of plant reproduction calls into being a peculiar principle or substance, so constituted that when brought into contact with an exposed mucous membrane it will provoke profound disturbance of the respiratory apparatus; but such an assumption is opposed not only to reason and fact, but also to nature. If man's relation to the external agents which are made to minister to his pleasure be thus perverted, is it not more rational to conclude that the disturbance arises from some defect in the subject himself, or some disturbance of the sentient apparatus, than from a subversion of the teleological purposes of natural objects?

In the present communication I do not propose to review the etiology and pathology of the disease,<sup>1</sup> but simply to advert very briefly to the psychical factor in the production of its paroxysms. Rousseau has aptly termed olfaction the sense of the imagination, and if we reflect how intimately related it is to the impressions we form of external objects, how it affects our emotions and influences our judgment, the clever definition of the French philosopher becomes all the more striking and felicitous.<sup>2</sup>

The case reported above is, so far as I am aware, unique. In looking through literature, I find that several authors refer to one reported by Thomas Capellini, of a lady, who was made ill by the sight of flowers, both natural and artificial, but the details are not given, and I regret to

<sup>1</sup> My views upon this subject may be found in the following publications: A Contribution to the Study of Coryza Vasomotoria Periodica, or so-called "Hay Fever," N. Y. Med. Record, July 19, 1884. Coryza Vasomotoria Periodica in the Negro, with Remarks on the Etiology of the Disease, N. Y. Med. Record, Oct. 18, 1884. Rhinitis Sympathetica, Essay read before Clin. Soc. of Md.; see brief abstract in Maryland Med. Journal, April 11, 1885, and in Internationales Centralblatt f. Laryngologie, etc., Sept. 1885. Observations on the Origin and Cure of Coryza Vasomotoria Periodica, Trans. Medico-Chir. Faculty of Maryland, 1885. Review of Morell Mackenzie's Essay on Hay Fever, etc., The American Journ. of the Med. Sciences, Oct. 1885, pp. 511-528. See also discussion of the subject before the American Laryngological Association (May 14, 1884, *vide* Transactions, p. 113 *et seq.*).

<sup>2</sup> Equally interesting is the influence which civilization exerts upon the development and impressibility of the olfactory sense. Without enumerating, much less elaborating the myriad conditions that conspire to produce such a result, we may safely lay down the general proposition, that the physical and moral forces of civilization—the social and intellectual environment of the subject—exert a marked effect upon the olfactory faculty by inviting or encouraging disturbance of the sentient and perceptive apparatus; that the higher we ascend in the social scale, the more readily our judgments are unnaturally influenced or perverted by impressions derived through the sense of smell, and that the more we recede from the inferior orders, the less perfect and acute this faculty becomes, the more susceptible to irritation, and the more predisposed to disease. In view, therefore, of the importance of olfaction as an avenue through which our mental impressibility is influenced—our imagination perverted—and in view of the relations of civilization to the sense of smell, we can easily understand why it is that this faculty is found more frequently deranged among the superior orders than in those lower down in the social scale and in the savage state.

say that I have been unable to obtain the pamphlet of Capellini, which is entitled *Dissertation sur les Effets des Odeurs*, and which was published in Paris (date unknown to me). While we cannot fail to recognize the important relation of olfaction to the imaginative faculty, and the frequency with which it serves as the connecting link between associated ideas, and while the above case illustrates the psychical element in the *excitation of the paroxysm*, it must not be considered that the affection itself is a disease of the imagination, a purely psychological phenomenon dependent solely upon a deranged mental impressibility. For both our present knowledge of the affection and the history of the case itself, militate against and destroy such a supposition. Indeed, we should distinguish carefully between a disease having a definite clinical history and subject to recognized pathological law, and a mere perversion of the perceptive faculty, although the latter may occasionally act as an exciting influence in the production of the paroxysms of the former. The chief lesson to be derived from the study of this particular case (*i. e.*, so far as the psychical element is concerned) is that it opens our eyes to the fact that the association of ideas sometimes plays a more important rôle in awakening the paroxysms of vasomotor coryza than the alleged vital property of the pollen granule.

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## MITRAL STENOSIS.

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CONSTRICTION of the mitral orifice is, on many grounds, the most interesting of the valvular affections of the heart. It is common and at the same time dangerous, standing, in point of danger, next to aortic incompetence; being, indeed, the more serious of the two in early life, so that it has a very practical interest. Its clinical history, again, presents peculiarities, some of which have long been recognized, while others have not yet received adequate notice. The special claim of this condition, however, upon our attention, arises from the fact that it presents greater difficulties in diagnosis than any other disease of the valves. It was the last of the valvular lesions to be associated with distinctive physical signs, and it is still not unfrequently entirely overlooked by physicians, while more commonly it is diagnosed as mitral incompetence, which is a far less serious affection. The physical signs are, in fact, extremely varied, and the attempt to elucidate their significance, and especially to attach diagnostic and prognostic meaning to

some of the combinations of modified sounds and murmurs, is the chief object and justification of this paper. Being a contribution to this particular end, historical and other references to the writings on the subject can only be incidental.

A remarkable fact is the relative frequency of its occurrence in women. This comes out whether the basis of the estimate is post mortem or clinical. Of 53 patients dying in St. Mary's Hospital, and examined after death, 38 were females and only 15 males, 72 and 28 per cent. respectively. Of 81 cases collected by Dr. Hayden, 54 were females and 27 males, 66.6 and 33.3 per cent. Dr. Dyce Duckworth in 80 cases found no fewer than 63 women—*i. e.*, 78.75 per cent. It cannot be said that any satisfactory explanation of this great disproportion of women affected by mitral narrowing has been given. It is true that rheumatism is more common in girls than in boys, but were this the only reason, there ought to be a general predominance of valvular disease of the heart in women, and not of this particular condition. Scarlet fever and measles, which are accountable for a certain proportion of the attacks of endocarditis, leading to lesion of valves, are still further from affording the required explanation. Possibly, the greater liability of girls to anæmia at the period of puberty may be one factor in the greater incidence of mitral stenosis in the female sex. Dr. Goodhart has pointed out how anæmia may give rise to valvular disease, and Dr. Sansom, in his *Lettsomian Lectures* (1883), has shown that it is in the insidious and not in the acute forms of valvulitis that mitral stenosis is brought about. These two facts fit together very well into a conjectural explanation of the predominance of this affection in females, especially when it is borne in mind that anæmia and chlorosis are attended with augmented arterial tension, which is in turn attended with increased backward stress on the mitral valves, a recognized cause of insidious damage.

A point on which there is less unanimity of opinion and, therefore, less conclusive evidence, is as to the special liability of children to mitral constriction. Dr. Hayden found reason to believe that such liability existed. Dr. Dyce Duckworth's statistics, on the contrary, do not support this view. The late Dr. Fagge, although he relates no case under ten, came to the conclusion that in children the mitral valve is especially prone to slow inflammation, leading to constriction, and Dr. Sansom speaks of seeing many cases under the age of seven. I have had two deaths at eleven, after protracted illness, and have had more cases of advanced mitral stenosis in children than of any other serious form of heart disease. It is, in my opinion, the most dangerous form of valvular lesion occurring in early life, and that in which there is least chance of compensatory changes sufficient to neutralize the effects of the obstruction to the circulation.

The subjects of mitral stenosis, up to a very advanced stage, have not the look of heart disease; they are neither pallid and anxious looking, as in aortic disease, nor livid and dusky, as in mitral incompetence, but often have a good bright color and cheerful expression, the lips perhaps being of too crimson a shade of red. Not unfrequently, up to the moment when, from some cause or other, serious symptoms have set in, and again after recovery from these, the patient is unconscious of embarrassment of the circulation, and is capable of ordinary work, even when this necessitates going up and down stairs. On the other hand, overexertion may be attended with a distressing sensation of constriction of the chest, so that the patient has to stand still for a moment, and feels as if he were about to die, while hæmoptysis is not uncommon; child-birth and attacks of bronchitis, or pneumonia, etc., bring on serious danger.

Mitral stenosis, moreover, is the form of valvular disease which, independently of actual inflammation or of ulceration, most frequently gives rise to arterial embolism. This is not, as a rule, the result of detachment of vegetations from the valves, but is due mainly to the formation of fibrinous coagula between the muscoli pectinati of the auricle or in the auricular appendix; or, more rarely, between the carneæ columnæ of the ventricle, which are shaken out of their beds by exertion or emotion and carried into the circulation. The stagnation which allows of such separation of fibrin may occasionally lead to the production of a large mass of solid coagulum in the atrium of the auricle, which either lies free in the form of a round ball or is attached to the wall of the cavity.

Another condition more frequently met with in mitral constriction than in any other form of valvular affection is great enlargement of the liver with true pulsation of this organ. This is not to be confounded with the jog communicated by the hypertrophied right ventricle, which is much more common. True hepatic pulsation is not a conspicuous phenomenon, but has to be sought for; it is not easily seen and it is scarcely to be felt at all. In order to bring it out, the hand must be pressed upon the enlarged liver at a part remote from the epigastrium and watched, when a gentle but considerable heave will be seen as the organ is distended by the reflux of blood into the hepatic veins. After repeated attacks of congestion the liver often refuses to yield to distention, so that in the later stages of the disease the hepatic enlargement may be less marked than at an earlier period, the result, no doubt, of that form of cirrhosis which is due to chronic congestion.

Related probably to the congestion of the liver is the occurrence of fluid in the peritoneal cavity before œdema is present in the legs, which is not uncommon; or the œdema will disappear speedily with rest in bed while ascites remains for a time; whereas cardiac dropsy, as is well



known, usually begins in the connective tissue, and ascites is late in its appearance, and is associated with extreme oedema.

The pulse of mitral stenosis is interesting. Different observers describe it as regular or irregular, according, no doubt, to the stage of the disease upon which the attention has been fixed. It is, according to my experience, almost invariably regular until the heart is obviously failing, unless the obstruction is complicated by regurgitation, or by valvular affection of the right side of the heart, or by intercurrent pulmonary affections. When irregularity comes on, it is usually at first inequality in the force of the beats, with perhaps slight loss of time in those which are weaker, and not any marked disturbance of the rhythm. Then some of the heart beats will fail to reach the pulse, no doubt from inadequate filling of the ventricle; the action of the heart may thus continue to be regular while the pulse is irregular. When, however, the heart is staggered by some serious pulmonary complication, the irregularity in its action, and, consequently, the irregularity of the pulse, may be indescribable, and it may be impossible to time either sounds or murmurs, or to determine their relation to the systole or diastole. But this is not constantly met with, even when bronchitis, or pneumonia, or pulmonary apoplexy supervenes. Many cases go on to a fatal termination with little or no derangement of the rhythm of the heart, and it is when there is regurgitation as well as obstruction that extreme irregularity is most likely to occur. The pulse, of course, follows the heart, sometimes, however, exaggerating its irregularity, mentioned as above; sometimes, on the other hand, disguising the extreme confusion revealed by the stethoscope. In some rare instances there is only one beat of the pulse for every two beats of the heart, the contraction of the left ventricle at every alternate systole being inadequate to raise the aortic valves. On listening to the heart under these circumstances, the aortic second sound is absent, the rhythm, as expressed by the sounds, being one-two—one, one-two—one. A weak pulmonary second sound may or may not be present—occasionally it is loud. Or there may be coupled heart-beats, one following the other, like an echo, accompanied by first and second sounds of quite different character, so that it appears as if the two ventricles were acting alternately, or one beat may be accompanied by a murmur at the apex, the other not. This curious modification of the rhythm of the heart, however, is not peculiar to mitral stenosis, and when it occurs in this disease it is often, though not invariably, distinctly attributable to digitalis.

But perhaps the most interesting point about the pulse is that the artery, which is rather small, as would be expected, is full between the beats, and presents the characters of moderately high tension—*i. e.*, it can be rolled under the finger, and is not easily flattened. In my experience this modified high-tension pulse is almost constant, and it points

to resistance in the capillaries, but the causes of such resistance is not readily perceived. It may be due to reflex contraction of the arterioles, or the blood may be charged with impurities as a result of imperfect elimination, consequent upon its sluggish movement, which is, perhaps, the most probable explanation, or there may be backward pressure from the veins which makes itself felt through the capillary network.

Another fact which has been impressed upon me, in the course of my observation of the various forms of heart disease, is the late stage at which general dropsy supervenes in uncomplicated mitral stenosis. Not unfrequently the subjects of it are free from œdema at the moment of death, and very commonly it is absent when the symptoms arising from the condition of the heart are most urgent; it may set in suddenly after these have lasted for some time. Ascites, again, may occasionally be present independently of œdema, or it may persist after œdema has subsided, occurrences which are altogether exceptional, if not unknown, in other forms of heart disease. When dropsy comes on comparatively early, regurgitation will usually be found as well as obstruction, and the incompetence of the valve may not improbably play a greater part in the production of the symptoms than narrowing of the orifice.

I have met with an extreme degree of dropsy only when there has been tricuspid stenosis, as a complication of the mitral stenosis, and have come, in the diagnosis of this complication, which in most cases does not reveal itself by separate physical signs, to rely upon blueness and lividity of the countenance, and waterlogging of the tissues and cavities.

This conclusion with regard to dropsy, which is a simple expression of my experience, receives confirmation from an examination of 53 cases, abstracted for me by Dr. Phillips, from the post-mortem records of St. Mary's Hospital, and of the 67 cases related by the late Dr. Fagge in his interesting paper on mitral stenosis in Guy's Hospital reports. Of the 53 St. Mary's cases, anasarca was present in 11, and slight œdema in 1, but in 2 out of 11 there was tricuspid stenosis, and in 7 more mitral incompetence, or some other complication, which in most instances was of itself competent to give rise to dropsy, leaving only two or three to be the effect of mitral stenosis.

In 47 of the cases collected by Dr. Fagge a post-mortem examination was made, and in 7 of these a detailed account of the symptoms and physical signs is given. In 2 out of the 7 there was no dropsy from beginning to end; in 3 others there was fugitive and slight œdema, while the patient was up and at work; swelling of the abdomen preceding, in 1 of these, the pitting of the ankles; in 1 case the dropsy appears to have been marked, but was relieved; in another, it was apparently considerable for a time; but even here it subsided, although present at death.

In this, the only one which at all followed the ordinary course of

cardiac dropsy, it is to be observed that the heart weighed twenty-six ounces, which is an unusual weight in uncomplicated mitral stenosis, and the aortic valves were diseased. In 40 cases the post-mortem notes are brief and the clinical records imperfect, and dropsy is mentioned only in 8, while out of this number 2 were complicated by tricuspid stenosis; 1 by aortic disease, the change in the mitral orifice being comparatively slight; 1 by renal disease, leaving only 4 instances in which uncomplicated stenosis had given rise to dropsy. It is, of course, possible that in some of the 32 cases in which no mention is made of dropsy, this may have been due to omission, but in 11 the history implicitly excludes the condition.

In the remaining 20 cases no examination was made after death, but the clinical history is carefully given, and 15 had no dropsy, and 1 only occasional œdema. Another, however, had an enlarged abdomen. Of the remaining 4, 1 had severe ascites only, which disappeared after paracentesis; in another, ascites appears to have preceded general dropsy; and in the remaining 2, in which cardiac dropsy followed the usual course, a systolic murmur of a kind indicative of mitral regurgitation coexisted with the physical signs of stenosis.

The comparative infrequency of dropsy as an effect of obstruction at the mitral orifice, appears to me to suggest an explanation of the paradox which Dr. Walshe so forcibly puts forth as the outcome of his observation, with regard to the relation between heart disease and dropsy, to the effect, namely, that while universal experience demonstrates the causation of dropsy by heart disease, something beyond and in addition to any one or any group of cardiac lesions is required for the production of the dropsy. His conclusions cannot be summarized without losing much of their weight, due as much to his vast authority as to the concentrated force of the propositions on which they are expressed.

“(1) Mitral regurgitation or obstruction or aortic regurgitation or obstruction may severally exist and for a lengthened period, without systematic dropsy supervening.

“(2) Mitral regurgitation and aortic regurgitation may coexist for years, and yet no dropsy occur.

“(3) Both of these propositions (1 and 2) hold good, whether notable hypertrophy do or do not exist behind, or in connection with the obstruction.

“(4) Simple hypertrophy of the left ventricle may reach the highest point without systematic congestive effects of any kind arising.

“(5) Dilated hypertrophy, even of the left ventricle, may last for years without any such effect ensuing, provided the dilatation be not in notable excess.

“(6) The heart may be in a state of advanced fatty metamorphosis, the pulse feeble and infrequent, the encephalic and respiratory functions exhibit the singular perversions attending a high degree of that disease, the entire organization betray functional languor and inactivity, and yet even the prætibial integuments fail to pit in the least under pressure.

“(7) Or the heart may be soft and flaccid, and the pulse persistently frequent, feeble, and irregular in force and rhythm, and yet no systematic congestions occur.



"(8) The natural relationship of width of the arterial orifices, and also of the auriculo-ventricular orifices, may be materially perverted, without the least systematic dropsy arising until the closing days of life.

"(9) Tricuspid regurgitation, where the right ventricle is in a state of dilated hypertrophy, as shown during life by swollen and pulsating jugular veins which fill from below, and as shown after death by actual examination, does not necessarily produce dropsy."

These are, he says, incontrovertible; he adds:

"I cannot, then, see how the conclusion is to be avoided that something beyond, and in addition to, any one or any group of the cardiac conditions referred to is required in order, as a matter of necessity, to entail the occurrence of dropsy."

And again:

"The existence of some active cause beyond and independent of the heart is further shown by the facts that there is no direct relationship between the amount of heart disease and of dropsy; that dropsy comes on suddenly, sometimes from extraneous causes, the state of the heart remaining, as far as ascertainable, in precisely its previous condition; and that dropsy diminishes and increases, comes and goes, either spontaneously or through the influence of treatment, while the organic changes in the heart remain permanent and unmodified."

The propositions are indisputable, but the difficulties arising out of them appear to have their origin in the implied condition that the effusion of serum into the tissues and cavities of the body is the effect simply of venous stasis and of consequent slowing of the circulation through the capillaries. But it is not a question merely of obstruction in the veins, but of pressure in the capillaries, and if *vis a tergo* in the arteries is wanting, the condition under which the exudation takes place does not arise. Of course, whenever the resistance to the return of blood to the heart is such that the pressure in the arteries is unable to overcome it, actual arrest of the onward movement of blood in the capillaries occurs, and life ceases at once; but, short of this, and subject to the production of the degree of intravascular pressure needed to keep up the nutrient outflow into the intertextural spaces, the movement of blood in the capillaries may be very languid. Given a retarded circulation through the capillaries produced by venous obstruction, the occurrence of dropsy will depend on the pressure of blood in the arteries, and in mitral stenosis the conditions are such as to forbid any augmentation of it. Followed to its source, the pressure in the circulation depends, ultimately, on the left ventricle. Increased resistance in the capillaries is met by the increase of strength and vigor given by hypertrophy, and when disease affects its outlet, compensation is attained by hypertrophy with or without dilatation.

Under certain conditions the left is reinforced by the right ventricle, under all conditions, in fact, in which the pressure in the pulmonary circulation is increased and the right ventricle is hypertrophied, except when such augmented pressure is intercepted by a narrowed mitral



orifice. But in mitral stenosis the left ventricle is not hypertrophied, and, in consequence of the narrowing of the orifice, can get no help from the right, beyond such as is afforded by the more efficient filling of its cavity. The amount of blood entering it is, in advanced cases, probably less than normal, notwithstanding the increased pressure in the pulmonary circulation, and can scarcely at any time exceed the normal. It is not, moreover, propelled into the arteries with increased force. Although then the veins may be full, and there may be every appearance of backward pressure in the capillaries, the real source of pressure in the capillaries is wanting.

It appears to me that a clear recognition of the reason for the comparative absence of dropsy in mitral stenosis tends to remove the necessity for any active cause beyond and independently of the heart.

Before describing the physical signs, it will be useful to review briefly the morbid anatomy and physiology of mitral obstruction. The characteristic effect upon the heart, a dilatation of the left auricle, with more or less thickening (sometimes thinning) of its wall, and great hypertrophy with some dilatation of the right ventricle. The left ventricle is not correspondingly enlarged, and may retain its normal size while the right, by its growth, displaces it backward, so that no part of it appears on the anterior aspect of the heart, and its apex is no longer in contact with the chest wall.

One fact which immediately arrests the attention is the great difference in the weight of the heart and the dimensions of its cavities in different cases. This is due chiefly to the varying degree in which the left ventricle takes part in the hypertrophy undergone by the right.

As a rule, the heart is not very large; it is smaller than in mitral incompetence and *a fortiori* much smaller than in aortic disease. Weights of ten and twelve ounces are common, and fourteen or fifteen will represent about the average. On the one hand, I find weights of seven and seven and a half ounces in adults, and on the other of seventeen and twenty-two ounces. Such differences are not merely capricious and accidental; they have some significance if we were only able to trace it. It is true that similar diversities are common in all forms of heart disease, and are to some extent accounted for by varying nutritional energy, but this is not a complete explanation. Other and often more influential factors, especially as regards their effect in mitral stenosis on the degree of hypertrophy of the left ventricle, enter into their production, and an attempt to follow them out cannot be otherwise than instructive.

Hypertrophy, by means of which the injurious effects of valvular imperfections on the efficient pumping of the blood through the heart are more or less neutralized, is no longer regarded as a vague conservative effect of nature, but is seen to be the response of the muscular

structure of the heart to increased work thrown upon it. Now, when the mitral orifice is narrowed, it is the left auricle and right ventricle only which are called upon to exert increased force, since there is no obvious cause of increased resistance in the systemic circulation. The same may be said when the valvular lesion is mitral incompetence with regurgitation; but here another element of change comes in which makes a difference between obstruction and incompetence. The high pressure in the pulmonary veins and left auricle, which is a result of the damming back of the blood and of the increased force of the right ventricle, causes a forcible inrush into the left ventricle during diastole; and this, so long as the orifice remains of the natural size, must distend, and in the long run dilate its cavity, taking effect, as it does, during the unre-sisting period of the ventricular rhythm. But an increase in the capacity of the cavity multiplies by so much the force required to expel its contents, and this constitutes a demand for hypertrophy. We have, then, as a result of mitral incompetence, dilatation, and more or less hypertrophy of the left ventricle, but the hypertrophy here is required as compensation for the dilatation, and not to overcome any direct effect of the impairment of the valvular apparatus. In extreme stenosis of the mitral orifice, the pressure which thus affects the ventricle is intercepted; there is scarcely time for it to be adequately filled during diastole, still less for any distending effect to be produced. We see, then, how it is that the left ventricle does not increase *pari passu* with the right. Such, however, is not always the case. The left ventricle is often dilated and more or less thickened, and here our reasoning appears to be at fault. But the difficulty disappears on reflection. Not uncommonly the change in the valves which glues them together and narrows the orifice, interferes at the same time with their apposition, and permits of regurgitation. Such regurgitation may, indeed, be for a long time the predominant result; and, in point of fact, incompetence often precedes considerably the establishment of obstruction. We have here abundant cause for differences in the condition of the walls and cavities of the heart found after death, and, it must be added, for variations in the clinical history, and especially for diversity of physical signs.

But even without regurgitation, it seems probable that in the early stages of the process which ultimately results in great constriction of the mitral orifice, the pressure in the pulmonary circulation may become considerable before the communication between the left auricle and ventricle is so far blocked as to prevent the ventricular cavity from being filled, or even distended, during the period of diastole. There may thus have arisen at an early stage dilatation and hypertrophy, which are utterly inexplicable by the conditions found at death, and we must look back along the whole line of morbid changes in order to understand their final product.

**PHYSICAL SIGNS.**—As has been already said, these are varied, and sometimes perplexing; but it has appeared to me that they afford a means of estimating approximately the degree of constriction which the mitral orifice has undergone. The contraction does not take place all at once, but increases by slow degrees through many months or years, and it is to be expected that corresponding change in the physical signs will accompany this change of mechanical conditions. The physical signs are not the same in a given case from beginning to end, and by following the modifications of the sounds and murmurs which gradually supervene, I have been led to recognize three stages of the disease.

The heart is not usually greatly enlarged; the apex is displaced to the left and sometimes also downward, but it is found, as a rule, not far from the normal situation.

The hypertrophy of the right ventricle, and the dilatation of the left auricle give rise to an extension of dulness outwards along the fourth and third left spaces, and the dilatation of the right auricle causes dulness up to or beyond the right border of the sternum. The apex beat is not well defined, and in advanced cases is frequently accompanied by a sharp and often powerful shock felt on palpation, which, however, is not a thrust; the impulse of the right ventricle is powerful, lifting the lower left costal cartilages, and making itself seen and felt in the epigastrium.

The systole of the left auricle has been said to communicate an impulse perceptible in the third space an inch or an inch and a half from the edge of the sternum, but this is a phenomenon which I have never seen.

Changes in the dimensions of the heart, however, have not the same direct relation to the degree of valvular mischief in mitral stenosis as in other valvular diseases, and it is by means of auscultatory signs that the division into stages is effected.

The pathognomonic sign of mitral stenosis is usually given as a pre-systolic murmur heard over a limited area to the inner side of the apex beat. It is not a smooth blowing murmur, but has a rough and vibratory character, and is often accompanied by a thrill perceptible to the hand at the same spot. Corroborative evidence is afforded by accentuation of the pulmonary second sound, the result of backward pressure in the pulmonary circulation, and, not unfrequently, by want of synchronism in the closure of the pulmonary and aortic valves, giving rise to reduplication of the second sound.

These are, in effect, the signs in the first stage, but another important note must be added, viz., that the second sound is audible at and beyond the apex. With such a combination of signs the diagnosis is extremely easy; a murmur heard near the apex and followed by a first and second sound can only be presystolic. If further aid were wanted, it would be



afforded by the character of the murmur, which, as has just been said, differs remarkably from other murmurs; it is not blowing and smooth, but vibratory or, in some instances, rumbling. And again, the way in which it runs up to, and suddenly ends in the first sound, which tends to become short and loud, is highly characteristic.

In this stage, that is when with the presystolic murmur both first and second sounds are well heard to the left of the apex, I have never known serious symptoms to arise from the condition of the heart, and I have seen illnesses of different kinds, even serious attacks of bronchitis, passed through without the intervention of embarrassment of the circulation. It is very rarely that patients are admitted into hospital presenting simply the signs above enumerated, but they are frequently met with in outpatient practice, and in consulting-rooms.

The second stage is marked by the disappearance of the second sound at the apex and by the short, sharp character of the first sound, which also usually becomes very loud; the first sound, in effect, comes to resemble a second sound. Mistakes in diagnosis may now be easily made. In mitral stenosis, at this stage, and in mitral incompetence there is alike heard a murmur followed by a short, sharp sound; but in the former the murmur is presystolic in time, and the sound is the modified first sound, while in the latter the murmur is systolic and the sound is the second sound. Very slight attention would, in most cases, suffice to prevent any confusion between the two; but an apex murmur is liable to be set down as the familiar systolic murmur of regurgitation without further investigation, and thus mitral stenosis, the most serious of the diseases of the valves, at a period, too, when symptoms may be impending, is taken for incompetence, which is attended with less danger than any other of the valvular affections. To bear this source of error in mind is to avoid it; but cases are sometimes met with in which, from absence of cardiac impulse and from the similarity between the sounds, it is not easy to follow the rhythm of the heart and time the murmurs and sounds. Flexible stethoscopes are here at a disadvantage as compared with the rigid wooden instrument, which communicates to the ear and head, not only sound, but a sense of shock which at once indicates the moment of the systole, and this when there is no impulse perceptible to the hand. It has been recommended to place the finger on the pulse and to ascertain which sound coincides with the systole guide could be more fallacious. Time is lost between the heart and the wrist, and not always to the same amount; the heart-beat and the pulse are never exactly synchronous, often alternate at equal intervals, and may go beyond this in their want of correspondence. The carotid pulse is a safer guide, but it is not easy for all observers to coördinate tactile and auditory impressions. The most trustworthy method of determining the relation of sounds to the cardiac rhythm is to find a spot in the region



of the base where the first and second sounds are unmistakably recognized, and then from this point to follow the sounds, step by step, toward the apex, when it will be found which of them it is that disappears, or which maintains some distinguishing peculiarity.

It is not, perhaps, of much consequence that an explanation should be given of the modification of the first sound and of the disappearance of the second sound, which are believed to characterize the second stage of mitral obstruction; but an explanation, however imperfect, or even the discussion of a point, may serve to keep it before the mind. The short, sharp first sound to which the presystolic murmur runs up, often with increasing intensity, the importance and significance of which were emphasized by Dr. Fagge, is considered by Dr. George Balfour, who has also done much to bring out the importance of this modification, if I rightly understand him, to be a sort of climax to the murmur, while the murmur is present, and to represent the remains of it when it is no longer heard; but this scarcely seems to be adequate, or, indeed, at all tenable, since the first sound is systolic, and marks, therefore, the arrest of the current of blood from the auricle into the ventricle, which gives rise to the murmur. It might again be plausibly attributed to the state of the valve, interposed like a membranous diaphragm between the two cavities, but this again does not bear critical examination. No very satisfactory explanation, perhaps, can be given at present; there are reasons, however, for ascribing the modified sound rather to the ventricular wall than to the valve: this impression, indeed, is forcibly suggested by the shock communicated to the hand. In hypertrophy the increase in thickness of the parietes modifies the first sound in a reverse direction, rendering it dull and prolonged; in dilatation, on the other hand, it becomes short, sharp, and loud, and comes to resemble that of stenosis, often to a remarkable degree; in palpitation, again, the first sound is very commonly extremely short and sharp.

The suggestion arising out of these considerations is that the abrupt first sound of mitral stenosis may be the result of the imperfect distention of the left ventricle, to which this valvular condition gives rise; the muscular walls at the first moment of contraction meet with no resistance, and acting rapidly are suddenly brought up, and made tense when resistance is encountered, and so produce the sharp first sound. In palpitation, the brief diastolic interval, not giving the ventricle time to fill, has a similar effect.

The disappearance of the second sound at and outside the apex is probably explained as follows: The second sound heard here, in the normal state of the heart, is that of the aortic valves. Of this I have satisfied myself by prolonged observation, the second sound at the apex, and that at the right margin of the sternum, from the third costal cartilage upwards, almost invariably corresponding in intensity and char-

acter, the aortic second sound, indeed, being not unfrequently better heard at the apex than at the base, while that produced by the pulmonary valves, even when accentuated, is not well conducted to the apex of the heart, and is not heard beyond it, unless, indeed, it is audible over a large part of the chest. There are two reasons, then, why, in an advanced stage of mitral stenosis, the second sound should not be heard at the apex; first, that as the left ventricle does not enlarge, it is overlapped by the right, which monopolizes the apex and displaces the left ventricle from all contact with the chest wall, thus preventing it from conducting to the surface the aortic second sound; next, that the aortic second sound is itself enfeebled in consequence of the diminished output of blood from the ventricle; the aorta is not distended, to the normal degree, and the recoil to which the second sound is due is correspondingly weak.

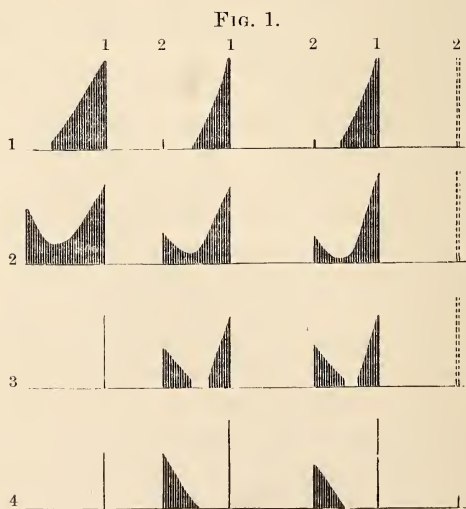
While the altered first sound in which the presystolic murmur ends abruptly, and the absence of the second sound at the apex are, together with the accentuated pulmonary second sound, and the want of accord between this and the aortic second sound, which gives rise to reduplication, the chief indications of serious narrowing of the mitral orifice, there are certain modifications of the murmur not unfrequently met with in advanced stages of this condition, which must be described.

Up to the present, the presystolic murmur has been spoken of as just preceding and running up to the first sound, when it corresponds with the auricular systole, and is the result of the propulsion of blood by the auricle into the ventricle. It is thus a short murmur only, but may be longer—*i. e.*, may begin sooner, when the auricle is hypertrophied and its systole is more powerful and protracted. This is not all, however, for the murmur may occupy the entire diastolic interval, and often follows immediately upon the reduplicated second sound, so that it seems to begin with this reduplication. It will then correspond, not simply with the auricular systole, but also with the active dilatation of the ventricle which takes place on its recoil from the systole. The diastole of the left ventricle is often regarded as a mere passive yielding to the distending force; first, of the blood entering it under pressure from the auricle and pulmonary veins, and then of increase of this pressure by the auricular systole, but when the naked heart is carefully watched, while in action, it will be seen that in its rebound from the extreme contraction of systole, the left ventricle dilates, and exercises a vigorous suction action which partially empties the auricles and causes the appendix rapidly to recede. When, again, the heart is removed by a rapid sweep of the knife, separating the ventricles from the auricles, and the pulsating ventricles are immersed in water, this active dilatation draws in sufficient fluid to yield a copious jet from the aorta and pulmonary artery. The first part, then, of the prolonged murmur often heard when the mitral orifice is greatly constricted is produced by the sucking

in of blood by the ventricle, the last part by the forcing in of blood by the auricle.

It should be added that the first part of the murmur has not always the marked vibratory character of the presystolic murmur proper, but still less has it the soft, blowing character of an aortic diastolic murmur, with which it corresponds in point of time; it may, perhaps, best be described as rumbling.

A further modification arises as follows: In a murmur occupying the entire diastolic interval, attention will usually detect a diminution of its intensity midway, and this may be carried so far that the murmur is cut in two, and the diastolic and presystolic portions are separated by a brief interval. Not only so, but from time to time there is an entire disappearance of the proper presystolic part, so that the obstruction at the mitral orifice is represented only by a true diastolic mitral murmur, which, however, is not likely to be mistaken for the diastolic murmur of aortic regurgitation, as it is almost invariably low pitched and rumbling, and often begins with a reduplicated second sound, instead of being smooth, blowing, and high pitched. Such a diastolic mitral murmur, moreover, is not heard, or certainly will not have its maximum intensity, at the same points as the diastolic aortic murmur, although I have heard it an inch or more beyond the right edge of the sternum in the right fifth space. It may, perhaps, be well to enumerate these varieties of murmur produced by the passage of the blood through a narrowed mitral orifice, representing them diagrammatically. They will be:



The double dotted lines represent the reduplicated second stage.

(1) The common presystolic or auricular systolic murmur, which may be short or long. (2) A murmur occupying the entire diastolic interval,

usually diminishing in intensity midway. (3) This murmur cut into two parts: diastolic and presystolic. (4) The diastolic part alone surviving. It cannot be said of these modifications of the obstructive murmur that they specially mark an advanced state of constriction, or that they have any very definite significance, but they are met with only in the second stage, and belong to the period of symptoms, being often associated with evidences of embarrassed circulation. In a young subject they would be of serious importance.

The third stage is marked by the disappearance of the presystolic murmur altogether, so that the sole remaining sign of the condition of the valve, present at or near the apex, is the loud, short, sharp first sound, with or without a systolic tricuspid murmur. This sharp and loud first sound is not unlike that heard in dilatation, with thinning of the left ventricle; but the absence of the second sound to the left of the apex constitutes a diagnostic difference, since this is distinct in dilatation. The absence of murmur and of any very considerable hypertrophy and dilatation may lead to the valvular disease's being entirely overlooked; instances have, indeed, come under my observation in which the heart has been pronounced normal on the eve of embolism or pulmonary complications.

No careful observer who has devoted much attention to the study of mitral stenosis has failed to notice the fact that the presystolic murmur is sometimes absent in cases in which an advanced stage of this condition is found after death. But it is not recognized and taught that this is extremely frequent. It is, in my experience, so common as to constitute a stage in the disease, and a large proportion of the cases of mitral obstruction which are brought into hospital to die would not be diagnosed if the presystolic murmur were looked upon as a pathognomonic *sine quâ non*, since it may never be present.

It must not be understood that the third stage, as here defined, is necessarily attended with serious symptoms. While this is the rule, patients may for a long time have only the modified first sound described and yet suffer little inconvenience. The principal justification for taking the disappearance of the presystolic murmur as a mark of a distinct stage in the clinical history of mitral stenosis is that, very commonly, when pulmonary complications set in, or other serious symptoms arise, the presystolic murmur is lost, and that it again becomes audible when these subside and the patient improves. It is a matter of repeated and familiar experience for cases to be admitted into hospital on account of serious symptoms with only the short sharp first sound spoken of and to leave with a loud presystolic murmur.

The probable cause of the disappearance of the murmur is the establishment of tricuspid regurgitation; this, at least, is conspicuous in a considerable proportion of cases. The giving way of the tricuspid valve,



and the occurrence of considerable reflux into the right auricle make it impossible for the right ventricle to sustain the same high pressure in the pulmonary circulation and in the left auricle, as was present previously. There is not, consequently, sufficient force in the current through the left auriculo-ventricular orifice, even when reinforced by the auricular systole, to generate sonorous vibrations. There being no valves, the contractions of the auricle will drive the blood backwards into the pulmonary veins as well as onwards into the ventricle, unless the pressure in the pulmonary circulation is adequate to resist the reflux.

The tricuspid regurgitation may or may not be attended with a murmur, but it will be manifested by a true jugular pulsation, and perhaps by hepatic pulsation. If a tricuspid murmur is present, it may become a source of confusion and error in diagnosis. The maximum intensity of the murmur is usually in the tricuspid area over the costal cartilages, just to the left of the ensiform, and over the lower end of the sternum; but not uncommonly the murmur is heard up to the apex, and perhaps even beyond it, so that it may easily be taken for a mitral murmur.

But another source of possible error arises out of the tricuspid reflux. It has already been repeatedly stated that accentuation of the pulmonary second sound is one of the important evidences of mitral stenosis, and this, of course, is due to the high pressure in the pulmonary circulation. When, therefore, the tricuspid valve gives way, and the pressure in the pulmonary artery is diminished, the second sound will cease to present the intensifications previously observed.

There has been so much of digression and discussion in the preceding account of the three stages of mitral stenosis, that it will be well to recapitulate the signs by which they are believed to be indicated, and these signs may at the same time be made more clear by diagrammatic representations of the sounds and murmurs.

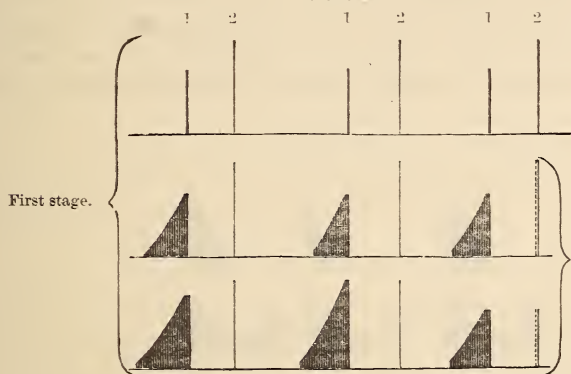
The normal heart sounds may be represented as follows: the short, thick mark standing for the heavy first sound; the taller thin mark for the sharp second sound.

The presystolic murmur attending the first stage of narrowing, then, will be indicated by shading running up to the first sound, which may be made coarse, so as to typify its vibratory character. But the first sound will itself be undergoing a modification tending to render it short and sharp and like the second. The mark representing it, therefore, will somewhat resemble that representing the second, as here shown. Up to this point the recognition of the presystolic position of the murmur in the cardiac rhythm is perfectly easy; followed, as it is, by two sounds, it cannot be misinterpreted.

The second stage is marked by the more or less complete disappear-

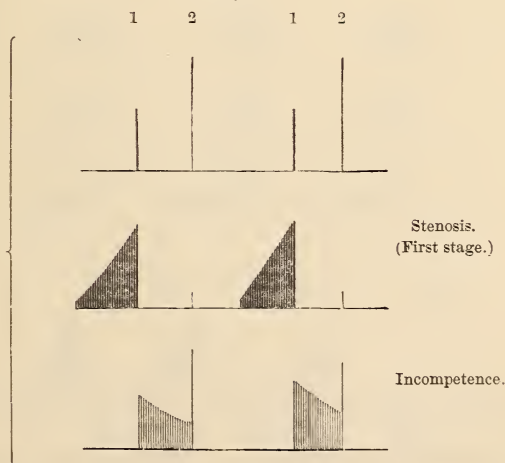
ance of the second sound at the apex, while at the same time the first has become more than ever short and sharp, so as quite to resemble the normal or accentuated second. That is, we hear at the apex a murmur, followed by a sharp sound; the murmur being presystolic, and the sound

FIG. 2.



the highly modified first. But in mitral incompetence, also, we have a murmur followed by a sharp sound, only the murmur here is systolic and the sound the second. The same words, it will be seen, may be used to describe both, and the systolic murmur and second sound of mitral regurgitation being the more common and familiar of the two, it is easy

FIG. 3.



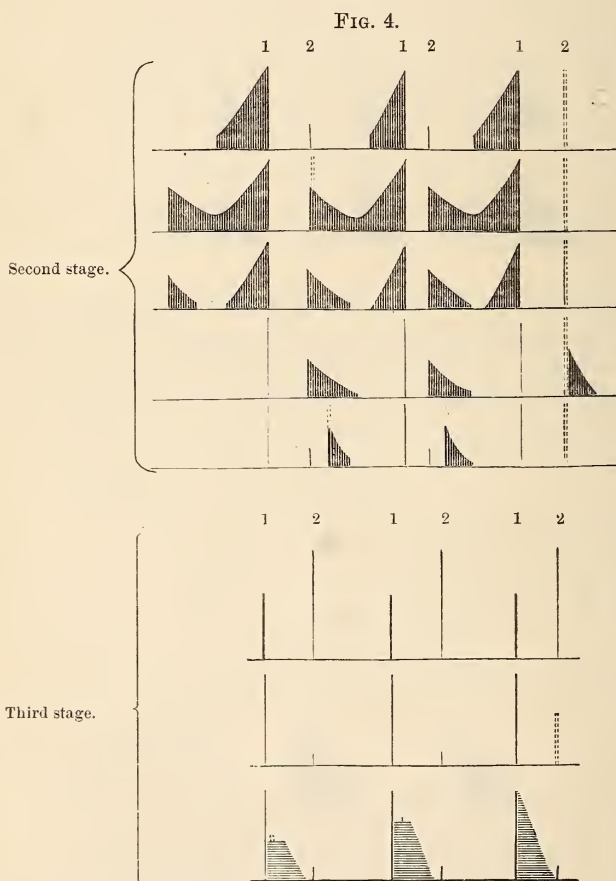
to take the presystolic murmur and modified first sound of stenosis for them. Such a mistake is, in fact, extremely common; but it will not

be made if the least attention is given to the character of the murmur, which, in regurgitation, is blowing or musical, and begins with an accent; while in stenosis it is vibratory, and ends in an accent.

These differences are illustrated in the accompanying diagrams, in which fine shading represents the smooth blowing systolic murmur (Fig. 3).

The variations in length and character of the presystolic murmur have already been represented, but they may be reproduced here (Fig. 4).

Finally, the presystolic murmur is no longer heard, and the most advanced narrowing of the mitral orifice is indicated only by the loud,



To illustrate the kind of contrast between the vibratory presystolic and the blowing systolic murmur.

short, sharp first sound, which may, however, be accompanied by a tricuspid systolic murmur shown by the horizontal shading.

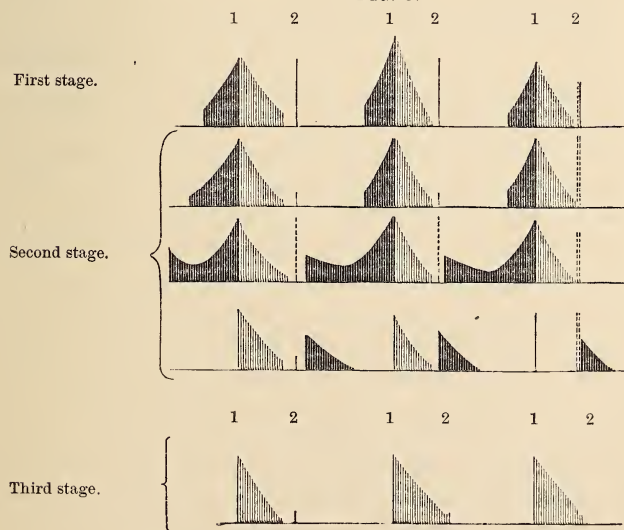
In the foregoing account of the sounds and murmurs attending constriction of the mitral orifice, incompetence of the valve, not un-

commonly associated with it, has been left out of sight for the sake of simplicity in description. It is possible, and, indeed, probable, that in some instances regurgitation takes place without giving rise to audible murmur, and when the heart is examined after death, it sometimes seems as if the irregular or thickened margins of the narrowed orifice could not possibly have come into the close apposition required to prevent leakage, while no systolic murmur has been noted during life.

In such cases the diagnosis of regurgitation as a complication of constriction can scarcely be made. There may, in fact, be no regurgitation even when the valves are not competent. As has been already stated, the course which the blood takes on the contraction of the ventricle will be determined by the direction of least resistance, and in mitral stenosis the fluid pressure in the aorta is a minimum, while the pressure in the auricle and pulmonary veins is a maximum; there may consequently—we may even say that if the circulation is to be sustained, and life is to go on, there must, in some cases, be such resistance in the auricle that no reflux of any moment into it can take place, however incompetent the valves may be. We need not, perhaps, therefore concern ourselves either with the diagnosis or prognosis of mitral incompetence complicating stenosis, which is not revealed by a murmur.

A murmur is, however, often present, and we may thus have a systolic apex murmur superadded to any of the signs enumerated—*i. e.*, in the

FIG. 5.



first stage, at and near the apex, will be heard a double murmur, presystolic and systolic, the former vibratory or rumbling, and leading up to a



short first sound, the latter smooth and blowing in character, beginning with the first sound and followed by the second; in the next stage the double murmur presystolic and systolic, divided by the sharp first sound, is still present, but the second sound is no longer heard at and to the left of the apex. In the third stage there is only a smooth systolic murmur, headed by a sharp first sound; the presystolic murmur, too, is more liable to be lost where there is incompetence as well as stenosis. Almost everything specially characteristic of obstruction therefore disappears, and the murmur only of regurgitation remains. Graphic representations of the sounds and murmurs of the different stages when a systolic murmur is present may be added. No interpretation of them will be needed beyond a glance at the corresponding diagrams on the preceding pages.

The account here given of the murmurs resulting from combined mitral obstruction and regurgitation will certainly seem too simple to those who are familiar with the difficulty of analyzing and recognizing them in practice, and of determining the place of each murmur and sound in the cardiac rhythm. This very difficulty may, if the observer is experienced, constitute a diagnosis, for in no other heart affection does such an extraordinary confusion of sounds and murmurs arise. Sometimes listening at the apex and at the base it seems as if there were two separate hearts beating at a quite different rate.

So long as the presystolic murmur is distinct, no serious uncertainty need arise as to the diagnosis. The significance of the absence of the second sound at the apex is, perhaps, obscured, while regurgitation as well as obstruction will give rise to accentuation of the pulmonary second sound. Still the presence of a presystolic murmur reveals the existence of stenosis and the additional gravity belonging to this condition will be recognized. But when, as frequently happens, there is no presystolic murmur, the case is greatly altered; we have, so far as murmurs are concerned, only a systolic mitral murmur as our indication for both stenosis and incompetence. The recognition of stenosis under these circumstances is not easy, but it is most important that it should be effected, since the pulse may be regular and the heart will not be greatly enlarged, conditions which would make the prognosis of incompetence alone favorable, whereas stenosis and incompetence together constitute a grave combination. The absence of the second sound outside the apex will usually be of great value in identifying the stenosis, but, if the incompetence have preceded it, dilatation of the left ventricle resulting therefrom may conduct the aortic second sound to the chest-wall. Here the modification of the first sound again comes to our aid. Regurgitation through the mitral orifice, it will be remembered, tends to destroy the first sound; stenosis, on the other hand, tends to shorten and exaggerate it, and prevents it from being lost; when, therefore, a systolic

apex murmur begins with a first sound, the question of stenosis, associated with the incompetence, should at once present itself to the mind; usually the sound will have the short, sharp character so often dwelt upon, or some marked peculiarity, and may be accompanied by the peculiar shock felt at the apex; but, even when this is not the case, we may arrive at a diagnosis of the existence of constriction, though it must often remain uncertain to what extent the narrowing of the orifice has gone, or which is the predominant effect, obstruction or regurgitation. It is when both effects are present that we have the extraordinary fluctuations in the physical signs; at one time a presystolic at another a systolic murmur only, and at another both, while the second sound will be reduplicated one day and single the next. It may be conjectured, with some plausibility, that when the pressure in the left auricle is well sustained, its systole is capable of generating a presystolic murmur, and the resistance to regurgitation is efficient; when, on the other hand, it falls below a certain point there is reflex and systolic apex murmur, while the contraction of the auricle does not drive the blood through the opening with sufficient force to produce sonorous vibrations. In intermediate states of pressure both murmurs may be heard.

**PROGNOSIS.**—Mitral stenosis stands next to aortic regurgitation among valvular affections in the order of gravity. The average age at death, however, as deduced from 53 cases abstracted from the post-mortem records of St. Mary's Hospital, is higher than I expected. This was found to be 33 for males, and 37 or 38 for females; one woman dying at the age of 68 had slight, another dying at 61 had extreme narrowing of the mitral orifice.

A suggestive inquiry is, why mitral stenosis is so serious a disease, and why, especially, it is attended with greater danger than mitral incompetence. One reason will be that the effect of obstruction at this point is not so easily neutralized by compensatory changes. Just as in the case of regurgitation, the compensating influence is the increased pressure in the pulmonary circulation and the hypertrophy of the right ventricle. This antagonizes incompetence of the mitral valve in two ways, by resisting the reflux into the auricle during the ventricular systole, and by more rapid and complete filling of the ventricle during diastole. Now in stenosis the only way in which the high pressure in the auricle and pulmonary veins can neutralize the effects of a narrowed orifice is by increasing the rapidity of the current through it, while the ventricle is relaxed. But the diastole only lasts a certain period, and when the constriction has reached a point at which the orifice will only admit, say the tip of one finger instead of three entire fingers, the ventricle cannot possibly be properly filled in the time available, even under pressure; the compensation, therefore, is inadequate. In aortic stenosis the left ventricle can take its own time in discharging its contents

through the narrowed orifice, the systole is prolonged; there is no corresponding prolongation of the diastole in mitral stenosis. While, however, it appears to be obvious that the provision for compensation falls short of that which comes into operation in other forms of valvular disease, on the other hand, since the narrowing is often found to have attained an extreme degree—such a degree as would in the absence of repeated experience have been thought quite incompatible with adequate circulation of the blood, and since the patients have lived through all the minor stages of the process, taking many months for their evolution, we cannot look upon the nature of the difficulty—*i. e.*, obstruction, and the difficulty of overcoming it by compensatory processes, as constituting the entire explanation of the greater relative danger. It has seemed to me that when once adhesion between the flaps of the valves has set in, there is a tendency for the adhesive process to continue, so as to encroach, progressively, more and more upon the channel. Changes, therefore, initiated by acute rheumatic endocarditis, would in this case be progressive; not, however, simply by continued shrinking of fibrous tissue or organized exudation, but because chronic inflammation is kept up by the friction and strain resulting from the narrowing of the orifice, and gradually glues the margins of the valves together. The process may be compared to the readhesion which it is so difficult to prevent after division of the web between the fingers.

The important point in prognosis, however, is the comparative prospect of life in individual cases, and it is in the estimation of this that the recognition of the different stages is of service.

We have, let us say, in a patient not complaining greatly of cardiac or respiratory distress, mitral stenosis indicated by a presystolic murmur and thrill, with a more or less sharp first sound in the usual situation; there is also an audible second sound at and to the left of the apex. This second sound shows that the disease is in the first stage and that the narrowing is not considerable. It is assumed that the pulse is regular. We should, of course, define the position and note the character of the apex beat, and endeavor to make out the size and form of the heart, directing attention specially to the existence of dulness to the right of the lower sternum and along the third and fourth left intercostal spaces, so as to bring into evidence any distention of the auricles. We may not be able to draw any trustworthy conclusions from the amount of hypertrophy and dilatation, but information on the point is indispensable. The aortic and pulmonary second sounds would be scrutinized and compared; accentuation of the latter will be present, and the degree of loudness and predominance of the pulmonary second sound will serve to indicate the degree of pressure in the pulmonary circulation. Variations in the intensification of this sound, however, move within narrow limits, and they are influenced by so many conditions,



that inferences based exclusively or even predominantly upon them would lead to error. Reduplication of the second sound, showing loss of synchronism between the aortic and pulmonary valves in their closure, is evidence of actual derangement of the cardiac mechanism; but, as it can be produced in a state of health merely by holding the breath, it need not necessarily have any great significance. An accentuated pulmonary and a reduplicated second sound then, while corroborating the diagnosis of stenosis of the mitral orifice by exhibiting effects resulting from it, are not necessarily of immediate serious prognostic import. Nor will the existence of a systolic apex murmur, indicating mitral regurgitation, add greatly to the gravity of the condition, in the absence of symptoms. So long as the second sound is not extinguished at and beyond the apex, the question as to danger relates rather to the future than to the present, and with regard to this, we have to fall back upon our knowledge of the history and tendencies of the disease. The degree of constriction actually reached is probably not dangerous, but it tends to increase, and if there has recently been an attack of acute rheumatism, still more if the patient is liable to frequent recurrence of subacute or slight rheumatism; if, again, the patient is marked by anæmic tendencies, there is every reason to apprehend continuous aggravation of the valvular affection. The younger the patient, the greater the fear of this; partly, perhaps, because of the greater liability to rheumatism. Later, there is the possibility that the mischief may be of old standing and stationary.

It must be understood that while a good aortic second sound at the apex, and along the right edge of the sternum, from the second space upwards, has not in my experience been met with, when serious results of mitral stenosis have been present, or impending, a contradiction of this particular indication by symptoms must always be accepted. No one indication is infallible.

When the second sound is lost at the apex and feeble over the aorta, there may still be a complete immunity from symptoms, under the ordinary conditions and circumstances of life; but there is no capacity for the adjustment of the circulation to deviations from these. We are not, therefore, to be thrown off our guard by the good looks of the patient, and by absence of complaints. Loss of the aortic second sound, associated with a short, sharp, abrupt first sound at the apex, and a reduplicated second sound, the pulmonary element in which is markedly accentuated, warrants a serious prognosis, and all the more when the presystolic murmur is modified in the way described, or is absent. Inquiry will usually elicit evidence of embarrassment of the heart on exertion, and this may assume a serious degree at any moment. An occasion for some extra exertion arises, which may be only slight; the muscular contractions drive the blood in the veins toward the heart,



which is the first step in the acceleration of its movements rendered necessary by exertion; the blood, however, cannot be passed more rapidly through the narrowed mitral orifice, and cannot, therefore, be forced through the lungs; the right cavities of the heart become over-distended, and the patient is at once brought to a state of extreme distress and great danger. In some cases relief is obtained by hæmoptysis, in others this does not occur, or it fails to relieve, and we have dyspnœa, congestion of the liver, and other associated symptoms.

A similar result may be produced by a comparatively slight attack of bronchitis or other pulmonary affection, by any febrile condition, or by anxiety or excitement. The right side of the heart is habitually over-taxed, and any acceleration of the circulation brings about distention of its cavities, with insufficiency of the tricuspid valve, and systematic venous obstruction. On the occurrence of such consequences the pre-systolic murmur will usually disappear, returning if recovery takes place.

Before symptoms have arisen, the considerations already enumerated as bearing on the question of the probable increase of the obstruction will apply with greater force, since the constriction is assumed to have proceeded further. Recent rheumatism, acute or slight, and any trace of gradually increasing tendency to shortness of breath will be reasons, the one for apprehension, the other for certainty, of progressive aggravation of the state of the valve, while childhood, so far from being favorable, is often the reverse. When this period of life is passed the condition of the heart and of the patient may remain much the same for years.

Anæmia, or obvious debility, will add to the gravity of the condition. Real strength, as tested by power of endurance, and capacity for exertion, will have a contrary significance. In some cases the end is brought about by the constriction reaching a point incompatible with life, in others it is due to want of power on the part of the heart and system to cope with the difficulty.

When symptoms have set in, and we are called upon to form an opinion whether a patient, who is suffering from dyspnœa, pulmonary congestion or apoplexy, venous obstruction, jugular pulsation, enlarged liver, dropsy, and other effects of overdistention of the right side of the heart, will recover from the attack, the first element in the mental calculation will be the severity of the symptoms. But recoveries are witnessed from conditions apparently so desperate that scarcely any combination of unfavorable symptoms can be pronounced absolutely hopeless, if it is the first time the patient has suffered from a similar attack. The number of times, then, that complications have arisen in the case, and the readiness with which they have been provoked, become considerations of the first importance. If the patient has had repeated attacks, and if a very slight cause has sufficed to set up serious symptoms, the danger is very great. It has seemed to me an unfavorable sign when, under such circumstances,

the liver does not enlarge; this is evidence of cirrhosis from previous congestion, and a reservoir for venous blood is lost. Advanced dropsy is always a very serious matter in mitral stenosis.

A complication of mitral stenosis sometimes met with is tricuspid stenosis. Tricuspid regurgitation is extremely common; it arises out of the mechanical and hydraulic conditions set up by the narrowing of the mitral orifice, the damming back of the blood in the lungs, the consequent high pressure in the pulmonary circulation and resulting stress on the right ventricle; it does not create a new difficulty, but serves as an indication and measure of the old difficulty. With regard to stenosis of the tricuspid orifice the case is different; it is not the direct outcome of antecedent mitral obstruction, and when present it adds a new source of obstruction to the circulation. What it is that gives rise to it can only be a matter of conjecture. The reason why the valves of the left side of the heart are so much more frequently the seat of disease than those of the right is apparently that the strain upon them is so much greater in consequence of the higher pressure in the systematic circulation. In mitral stenosis, the strain upon the pulmonary and tricuspid valves becomes probably quite equal to the normal strain upon the aortic and mitral valves, and this perhaps may account for the occurrence of tricuspid valvulitis and stenosis, especially when there are recurrent attacks of rheumatism.

However this may be, it is a fact of clinical observation that narrowing of the tricuspid orifice is more commonly met with in association with narrowing of the mitral orifice than with any other valvular affection of the left side of the heart, and when it supervenes it constitutes a most formidable complication.

It is consequently very important that it should be recognized early. This I have not found to be an easy task. A perceptible tricuspid murmur is described, and interesting cases in which it has guided to a correct diagnosis are related. I have myself heard what I believed to be a pre-systolic tricuspid murmur; but, on the other hand, I have frequently had cases under my care in which tricuspid narrowing has been diagnosticated during life, and demonstrated after death, without any such murmur having been recognized although repeatedly and carefully sought for.

The grounds, then, on which the existence of obstruction at the tricuspid orifice may be inferred are a degree of blueness of the face and lips unusual in uncomplicated mitral disease, and liability to coldness and dusky lividity of the extremities. There will be great distention of the jugular veins, but less pulsation in them. Dropsy also becomes a more marked feature, and indeed in my experience extreme general dropsy in which all the tissues of every part are laden with fluid is not met with as an effect of obstruction at the mitral orifice unless there is also tricuspid narrowing.

TREATMENT.—The treatment of mitral stenosis is conducted on the same general principles as obtain in other forms of heart disease.

Considering first the important period before the disease is so far advanced as to give rise to serious effects, and symptoms are absent or induced only by overexertion, the damaged organ must be protected from any undue strain at the same time that nutrition of the tissues generally is kept up. The great difficulty is to reconcile these two conditions, which are more or less conflicting; but this only affords an opportunity for the exercise of the common-sense and clinical sagacity which are indispensable in the physician. It would be as mischievous to the patient as it would be insulting to the medical man to lay down strict rules. All that is necessary is to offer such suggestions as arise out of the special tendencies of the particular form of disease, which must be adapted to the enormous diversity of individual cases, constitutions, and habits. We must, however, look before us, and not wait for the recognition of such tendencies till symptoms compel our attention to them.

The patient's avocation and mode of life generally should be interfered with as little as possible, unless his habits are such as are distinctly injurious. Restrictions which go beyond the mark may of themselves impair the health, or they may render the sufferer's life unnecessarily anxious and miserable, or they may provoke reckless reaction.

Common-sense precautions must be taken against rheumatism and catarrh, or other effects of cold, but there should be no cultivation of a susceptibility to changes of temperature by excessive care. Flannel or other woollen material should be worn next the skin, sitting or standing with wet feet or in damp clothes must be avoided, as must draughts and hot, close rooms. It will be desirable to send a patient out of a climate or district conducive to rheumatism, and to forbid an occupation attended with much exposure.

In the matter of exercise there should be no violent exertion, and fatigue should not be carried to the point of exhaustion. Any effort which causes pain in the chest, or marked dyspnoea, must be looked upon as harmful, and must be avoided. Short of the above, the more the patient can be out of doors, and the more exercise he can take the better, and it will often be found that by beginning gently he will easily attain a rate of walking which, if attempted in the first instance, would have brought him to a standstill; or he may mount an incline without distress which at his ordinary pace would have been impossible. He may even be permitted to bathe and swim if experience shows that he bears it well. It is not prudent to send patients suffering from this or any other form of heart disease to mountain resorts. The effects of the diminished atmospheric pressure cannot be foreseen in individual cases; it is apt to set up palpitation, and should unfavorable symptoms supervene, removal—which is imperative—may be difficult and dangerous.



We would gladly add, were it of any use to do so, that anxiety and depressing emotions ought to be excluded from the patient's life.

The food and drink may be liberal and varied, but they should be distributed as equably as possible among three meals, not one of the three being specially large. If the nourishment for the day is taken at one huge repast the vessels are at one time filled, perhaps to undue distention, by the absorbed products of digestion, and then gradually unduly depleted. Such extremes throw unequal work upon the heart, to which disease renders it less able to adapt itself. There is, again, the liability of the distended stomach to carry up the diaphragm and so directly embarrass the heart by pressure. While the inclination, digestive powers, and idiosyncrasy of the patient should be duly regarded, it is important that fruit and farinaceous and other vegetable articles and milk should enter into his diet so that it may not be too nitrogenous. Further, due regard must be had to the fact that excess of any kind beyond the actual requirements of the body tends to the accumulation in the blood of nitrogenized waste which may act as an irritant, and will certainly give rise to resistance in the arterio-capillary circulation, one of the influences most to be dreaded in the long run.

Constipation must never be permitted. Both the mechanical and the chemical effect of fecal accumulation are injurious.

Medicines, except for the correction of functional derangements, and the prevention or removal of anæmia or debility, are not required, and being unnecessary will, if given habitually, be injurious.

When symptoms set in, excluding embolism, which will not be here dealt with, they will be either pulmonary complications due to the effects of the obstruction in the pulmonary circulation, or they will be further effects of such obstruction upon the right side of the heart. The treatment will not be really different in the two cases—nor will it usually be possible to distinguish between them, since the additional stress thrown upon the right ventricles by the occurrence of pulmonary apoplexy or congestion will generally break down the valvular competency of the tricuspid.

The danger to life consists in the inability of the right ventricle to force the blood through the lungs. Both ventricle and auricle become extremely distended, so much so as to be almost paralyzed by overstretching of the muscular fibres in their walls. When the tissues of the heart have undergone degeneration, or when the right ventricle is worn out by protracted overstrain, death may be sudden, either as the result of an effort or motion, or without obvious exciting cause. The fatal termination is, indeed, very frequently abrupt and unexpected, but it is not sudden death while in apparent health, but in the course of illness. The symptoms of overdistention of the right side of the heart are sufficiently conspicuous and familiar: urgent dyspnoea, with more or



less duskiess or lividity of the face, which, however, even at this period may not be extreme; cough, which may or may not be attended with hæmoptysis, and a small, weak, and irregular pulse, many beats of the heart not reaching the wrist, and in extreme cases scarcely any. The contrast between the weak pulse and the powerful impulse of the heart is very striking, but the impulse felt is that of the right ventricle only, and there is no proper apex beat. The jugulars are distended and pulsating, and an indication, not always looked for, but of the greatest importance and significance, is enlargement of the liver, which may be felt to extend below the umbilicus and across the epigastrium to the left hypochondrium; it is nearly always jogged by the violent contractions of the right ventricle, and may pulsate from reflux into the hepatic veins. Associated with this there may or may not be a slight amount of effusion into the peritoneal cavity; anasarca need not be present, though sometimes it supervenes suddenly while the struggle is at its height, or even when improvement has begun.

Under such circumstances the first and most important thing to be done is to relieve the right ventricle. There are three ways of effecting this: by venesection, cupping or leeching, and purging. Bleeding from the arm or jugular is the most prompt and effectual, and it is certain to come again into more general use as the profession becomes familiar with the remarkable results which may be witnessed in cases apparently hopeless; pulselessness, cold extremities, and the cold sweat of impending dissolution are not contraindications as long as there is power in the laboring right ventricle. While blood is abstracted on the one hand, brandy and other stimulants may be administered on the other; or in desperate cases ether or brandy, or both, may be injected under the skin. It is in private practice that the best opportunities for successful bleeding are met with. In the case of hospital patients there is usually a smaller reserve of strength, and the rest, warmth, care, and nourishment they receive, to which they are strangers outside, make such a difference in their favor that milder measures are sufficient. Leeches may therefore be employed, or cupping, with or without the abstraction of blood. A very suitable situation for the application of leeches or the cupping-glasses is over the enlarged liver. It is not supposed that blood is abstracted from the organ, but the pain usually present in the region of the liver and the sense of fulness and oppression are relieved. After leeches the bleeding may be encouraged by poultices. I have seen recovery so far as to allow of the patient's leaving the hospital after the application of eight leeches in a girl of thirteen, when not only was she cold, pulseless, and apparently moribund, but when stasis in the capillaries of the surface had actually begun, giving rise to large livid patches on the abdomen and elsewhere.

As an accessory to the abstraction of blood in the attainment of the

same object, viz., the diminution of the afflux of blood to the overdistended right ventricle, or as the principal means of effecting it, purgatives are to be employed. A mild aperient will be of no use; the purgation must be decided. Nor is it, in my opinion, a simple matter or purgation to be induced by any method which may happen to be convenient. A mercurial pill or powder appears, according to my observation, to have a greater effect in reducing the liver and relieving the right heart than more powerful purgatives of another kind.

As has been already said, there is no incompatibility between the depleting agencies just described and stimulants.

Stimulants, indeed, are often required, but until the right side of the heart is relieved, neither stimulants nor the remedies which act upon the heart will have a proper effect. They may, on the contrary, do harm; and much as the frequent and irregular action of the heart may appear to call for digitalis, the administration of this or similar drugs had better be postponed till the stress upon the right cavities of the heart has been relieved by the bleeding or purging.

Digitalis may then be given, at first with ammonia, ether, and belladonna; afterwards with nux vomica or strychnine; or, again, with tincture of iron. Convallaria, or caffeine, may be substituted for digitalis when the latter appears to disagree with the patient or fails in its effects. Caffeine, however, in my hands has been of much greater value taken at the same time with digitalis than in place of it, a profuse flow of urine withheld up to that time, coming on when the caffeine has been added. It is scarcely necessary to repeat, what is so well known, that diuresis is the most certain evidence of the beneficial effects of digitalis. But it may be added that it is not the increased secretion of urine which does the good. It is in itself only one of the various secondary results of the improvement in the circulation, showing, as it does, that pressure has been lessened in the venous and increased in the arterial side of the capillaries, and that the rate of movement through them is increased.

Other diuretics, squills, scopolium, juniper, the salts of potash, find their place as accessories or as alternatives, when digitalis and caffeine, or convallaria, have been taken so long that they begin to lose their effect.

In mitral incompetence digitalis may be given almost indefinitely, and patients often take it for years with obvious advantage, but such is not the case in mitral stenosis. Here the effects must be watched from day to day; at any time the action of the heart may all at once become disordered, many of its beats not taking effect on the systemic circulation, and failing to produce a pulse in the radial artery; the heart may be acting with fair regularity, and at the normal rate, when the pulse is rendered irregular in this way; or its rate may be slackened, and its rhythm disturbed, the effects of which will be exaggerated in the pulse.

It is not uncommon to have established under the influence of digitalis the apparently alternating systole of the two ventricles already mentioned, so that quite regularly there will be two beats of the heart for one of the pulse, pulse and heart sometimes alike acting regularly; but more commonly, the heart-beats being coupled, a weaker beat following a stronger one at a briefer interval, giving on auscultation the sounds one-two—one (silence) one-two—one.

This derangement of the heart's action is usually accompanied by a sense of oppression and distress in the region of the heart, and sometimes by nausea, and frequently the liver will be found to be swelling again. The digitalis should be at once suspended; afterwards a repetition of the mercurial aperient may enable the heart to bear it again, or its place may be taken by some of the other remedies enumerated.

## AFFECTIONS OF THE EYE ACCOMPANYING MUMPS.

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THE implication, either concomitantly or by a process of metastasis, of other and distant organs during an attack of mumps, is a well-known peculiarity of that disease. The method of this transference is, I believe, one of the many questions pertaining to that obscure disease that yet remain to be solved by the general pathologist.

The testicle in man, and the mammary gland in woman, have been recognized from the earliest history of medicine as the objects of this metastasis of disease from the parotid glands; and within late years the ear has been discovered to stand in a similar unfortunate relation. That another important organ of sense was in danger from this usually mild and innocent affection I was not aware until the following case fell under my observation:

CASE I.—Frank W., a colored boy of fifteen, applied to me for treatment on July 25, 1885. He stated that the mumps had been going the rounds of his family, and that he had a slight affection of the *left* gland. On the third day of the disease he got wet, and two days after he noticed that his right eye was affected. On the fourth day of the eye trouble he applied to me. I found the upper lid much swollen, and he was unable to elevate it. On raising it I found the cornea intact, but there was a considerable clear chemosis of the conjunctiva at the outer and inner portions: the pupil was dilated, but not ad maximum, and there was paralysis of accommodation. There was diplopia in the upper, lower, and extreme left fields of fixation, and the upward and downward move-



ments of the eye were visibly restricted. There was a noticeable exophthalmos.  $V. = \frac{4}{18}$ ;  $V. \text{ in } L. = \frac{4}{4}$ . Ophthalmoscopic examination showed the media to be clear and the outlines of the disk sharp, but there was a marked tortuosity of the retinal veins. He was advised simply to bathe the eye in hot water.

On the 28th the lid was much less swollen, and he could raise it somewhat. The restricted movement was about the same in upper fixation field, but was improved for below; pupil smaller; chemosis almost gone; some slight exophthalmos. Ophthalmoscopic appearances unchanged.

$$V. = \frac{4}{6}.$$

*Aug. 1.* Pupil smaller and accommodation slightly restricted. Diplopia at about  $20^\circ$  up and down from the central point of fixation, and at the most extreme left field; ptosis better.  $V. = \frac{4}{5}$ . Tortuosity of retinal

veins not so great. The patient was not seen after this, from which I infer that he went on to a recovery more or less complete.

At the time of making this observation I could not call to mind any reference in my reading to similar cases, but considering the evidence very strong as to the connection between the parotid and eye affection, and in view of the absence of any other justly assignable cause, I searched the literature at my command to find, if possible, some support for my conviction.

The text-books on medicine and ophthalmology are alike silent on the subject, as are also the journals devoted exclusively to ophthalmology. A reference, however, to a paper in a French journal of military medicine, fortunately put me in possession of eleven cases of a similar character, and as these are the only mention I can find of the subject, and as the journals in which they appear are probably accessible to but few general practitioners or specialists in this country, I think it not amiss to give brief abstracts of the cases.

The first reported cases are those of M. Hatry.<sup>1</sup> These were observed during an epidemic of mumps among the troops stationed at Lyons, in which there was an unusual number of metastases to the testicle.

**CASE II.**—Man, twenty-four years of age, taken with mumps on March 24th. Admitted to hospital on account of visual trouble on the 31st. At that time there was a bulbar conjunctivitis and a headache. On the tenth day of the affection the parotid swelling was better, but there was much swelling of the upper lids; V. F. and color perception good; no photophobia; V. on both sides  $\frac{2}{15}$ . In both eyes there was cloudiness around the optic nerve entrance, which was redder than normal. There was an extraordinary turgescence of the arteries and veins, and there was venous pulsation. There was suppura-

<sup>1</sup> Considerations sur des troubles visuels observés avec l'altérations de la papille et de la zone papillaire chez les malades atteints d'oreillons pendant l'hiver, de 1875-76. Par M. Hatry, Med. Maj., 1st class. *Recueil des Mém. de Méd. et de Chirurg. Mil.*, 3me series 32, 1876, pp. 306-316.



tion of the submaxillary region. The ophthalmoscopic signs gradually subsided, and on the 15th of May  $V. = \frac{4}{5}$ .

CASE III.—Man, aged twenty-four. Examined on the third day of the disease,  $V. = \frac{2}{3}$ . No sign of eye complication except a slight conjunctivitis, redness of the disk, and circumpapillary haziness. In seventy days these signs had disappeared, and  $V. = \frac{5}{6}$ .

CASE IV.—Man, aged twenty-three.  $V. = \frac{2}{15}$  in both eyes; lids swollen; injection of conjunctiva of ball and lid; photophobia; strong injection of the papillæ, with ill-defined edges. In fifteen days all these symptoms were gone.

CASE V.—Had metastases to left testicle with severe constitutional disturbance. Papillæ veiled. In eight days papillæ normal.  $V.$  not tested.

CASE VI.—Patient a man aged twenty-five. Metastasis to testicle on ninth day of the disease; papillæ injected with infiltration of the peripapillary zone.  $V. = \frac{1}{5}$  L.,  $\frac{2}{3}$  R.;  $V.$  F. and colors good. In five days all symptoms were gone.

CASE VII.—Man twenty-four years of age. Examined on ninth day of the disease.  $V.$  normal, conjunctivæ normal, injection of papillæ and enlargement of retinal vessels.

CASE VIII.—Man aged twenty-six. Slight palpebral conjunctivitis.  $V. = \frac{1}{2}$  R.,  $\frac{2}{3}$  L. Injection of papillæ, with diffuse borders. In fourteen days the ophthalmoscopic image was normal.  $V. = \frac{4}{5}$ .

CASE IX.—Man twenty-three years of age.  $V. = \frac{2}{3}$  L.,  $\frac{2}{3}$  R. Congestion of conjunctiva of lids; papillæ congested, with ill-defined borders; vessels much enlarged. In ten days all signs had disappeared.  $V. = \frac{5}{6}$ .

CASE X.—Man aged twenty-three.  $V. = \frac{1}{2}$  L.,  $\frac{1}{20}$  R.; papillæ injected, particularly on external half; diffuse borders; enlarged retinal vessels; injection of palpebral conjunctiva. In twelve days there was a complete disappearance of all symptoms.

CASE XI.—Man twenty-four years old. Metastasis to testicle.  $V. = \frac{1}{2}$  in each; deep injection of disk; veins double their normal size, and very tortuous; arteries tortuous and large; well-marked zone of peripapillary infiltration. In fifteen days eyes normal.

The only other case I have been able to find on record is the one by Talon,<sup>1</sup> from whom I got the reference to those of Hatry.

CASE XII.—This was also in the person of a young soldier who had double mumps, the swelling being greater on the left side. On the fourth day of the disease there was metastasis to the right testicle. Both the mumps and orchitis improved until the twenty-seventh day, when  $V.$  in the right eye became affected. There was pain in the frontal region, and a sensation of gravel in

<sup>1</sup> Observation d'atrophie du nerf optique consecutive á des oreillons, by M. Talon, Med. Maj., 1st class. *Archiv. de Méd. mil. et de Pharm.*, 1883, i. pp. 103-109. Lest any one else may be misled in the same way as I was, I would state that the name is incorrectly given in the bibliography in vol. xiv., Nos. 3 and 4 of the *Archives of Oph.*, as Talon, and the page 109, instead of 103.

the eyes, and a slight conjunctivitis. On the twenty-ninth day the pupil was dilated and unaffected by light; there were also great cephalalgia, vertigo, and nausea.  $V. = \frac{1}{10}$ . Ophthalmoscope showed the papilla much injected and ill-defined in outline, with a peripapillary injection extending four or five mm. from the disk; veins large and tortuous; arteries enlarged; urine healthy; no history of syphilis. Dr. Terson examined the patient and pronounced it optic neuritis. The case went on to atrophy of the nerve and complete abolition of vision.

From a study of the cases reported up to the present time, we find that the principal parts of the eye to suffer from a metastasis of the mumps to that organ are the lid, conjunctiva, and optic nerve, and also in my case the third pair of nerves. The exophthalmos present in my case I think due mainly to the paralysis of the ocular muscles, allowing the cushion of the orbit, by its elasticity, to push the ball forward, though it seems highly probable that there was at the same time a serous infiltration of these tissues, as there was of the conjunctiva and lid. The disease may be unilateral and of varying degrees of intensity. The prognosis of the affection seems to be, in the main, good, the only case terminating in blindness being that of Talon. This, however, suggests the possibility that some of those atrophies of the optic nerve, especially when unilateral, which are accidentally discovered, and the origin of which cannot be traced to any of the hitherto recognized causes, may be due to a metastasis of mumps in childhood.

As regards pathology, anything in the way of explanation must, from the paucity of accurately observed data, be merely speculative. Hatry and Talon look upon the eye trouble as consecutive to a cerebral complication. It seems to us, however, that this could not be possible in all the cases reported. It is hoped, however, that the publication of these cases may be the means of calling the attention of both the physician and ophthalmologist to a new field for their combined observation and study.

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## ON RECENT GYNECOLOGY.

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THIS century has been, and continues ever more and more to be, a period of rapid development, not in medicine alone, but in every department of human activity. Standing in the whirlpool of religious, political, mercantile, and medical change, one is disposed to think the times are revolutionary, and have overstepped the limits of law or of the ordinary or justly expected rate of change or of progress. But it may not

be so. The next generation of philosophers will then be equally astonished and puzzled in the embroilment of their time, and will look back on the distant view of what they may regard as the pleasant settled peace of ours.

The increase of medical science, in mere bulk, in recent and specially in our own times, has compelled men, and as it goes on will increasingly compel men, into what are called specialties. In an important sense this is an evil, but it is an inevitable evil. Human time is limited; the powers of our mental faculties are limited; and it is a vain lament that we cannot, when very hungry and thirsty, devour and assimilate the fine food which science so copiously and daintily prepares for us. The time of Admirable Crichton is left far behind; but the advantage and superiority of the medical man who has most of his quality will always remain. Hope of remedy for the Babel confusion lies in the discovery of a common tongue. The deserts and mounds of chips of knowledge may be brought into subjection to general, and yet more general, laws, and the utmost perplexity of details be reduced to order and made an easy study.

At a period now remote, medicine was itself a specialty. When the universities were founded, one chair was enough for it and all its departments. When hospitals were founded, there was no classification of patients. A century ago the whole library of midwifery and diseases of women was comprised in a few volumes; and there was no library of gynecology; while it is surely now no exaggeration to say that a single year produces as much obstetric and gynecological literature as all the ages before the century began. In London, midwifery and gynecology are now, but only now, beginning to be taught systematically; it is recognized that thirty or forty lectures are inadequate for the display of the subject. The diseases of the foetus and of newly born children await a fuller development, lying now in the position of a mere appendage to midwifery. Medical jurisprudence is separated from midwifery. Gynecology, or diseases peculiar to women, long a neglected appendage to obstetrics, is nobly struggling into recognition and importance. Already it owns a large and growing library, special departments in great hospitals, and minor hospitals of its own. And yet it has not, in Great Britain, special teachers.

It is not to be wondered at that in these circumstances, a contemporary should find himself in a maze of difficulties when he attempts to estimate the present position of gynecological science, and to appraise the numerous novel proceedings which spring up luxuriously on the newly turned soil. Time and research will try and purify the science; wisdom and experience will cleanse the field of practice from innumerable weeds; and, as we have already said, the retrospective glance of the medical historian, seeing the diligence, the progress, and the achieve-

ments of our time, may, only by special inquisitiveness, discover the weedy part of the growth which now entangles and embarrasses and perplexes us. Activity is not necessarily, and certainly not all, progress. An American orator has recently discoursed to the New York Academy of Medicine on the great power of mere restlessness and of love of money. It is gentler and nobler motives that impel the triumphant car of true stable gynecology.

There is a well-known ancient distinction between medicine and surgery, as imperfectly defined as it is ancient. Medicine has always taken precedence, and will always take precedence, for the head and its work are nobler than the hands and their work; and yet who can draw the line between the work of the one and of the other? Where is the opening for jealousy to intrude between the physician and surgeon? Both have ample scope for the highest powers of the mind. Young men, men of enterprise, men of action, turn naturally to surgery. Maturer years, study, research turn to physic. Wisdom in a physician, skill in a surgeon. Gynecology is partly medical, partly surgical; and its practitioners fall into the two ranks, or nearly so. Every gynecologist is, to some extent, a surgeon; but it is rare to find the qualities of physician and surgeon highly developed in the same individual. In the great field of general medicine, the distinction is here and there maintained between the two sets of practitioners; in the lesser field of gynecology, there is as yet scarcely room for both anywhere; and there is, consequently, at least an appearance of jealousy between those affecting gynecological medicine and those affecting gynecological surgery.

If it is difficult to separate by a definite boundary medicine from surgery, it is still more so to draw a line between ordinary and general medicine and gynecological medicine, and between ordinary or general surgery and gynecological surgery. A lasting distinction will not be made on any preconceived plan, nor fostered by any arguments. We have no record of any plans or any arguments in the now ancient separation of general medicine and surgery; it will grow up on Darwinian principles. The fittest for the times will survive. Science will send forth branches in unforeseen directions. The public will have the practitioner who suits them best. The ovariologist or hysterectomist who is most successful will sweep most into his net, whether he be a general, or a gynecological surgeon; and so it should be. In the interior of hospitals, especially of the great old establishments, there seems to be room enough for gynecological medicine, and gynecological surgery has found a considerable unchallenged area for its work. But the surgeons have, in some of them, claimed ovariectomy and hysterectomy, refusing to resign them to new gynecological members of the hospital staff. The surgeons have the advantage of ancient position and respected rights. The gynecologists have the advantage of youth, growth, and prosperity.



The matter may be left, without anxiety for the future, to its destiny, which is not as yet manifest. Whichever way the ultimate decision, in hospital or in private practice, may fall, no evil will accrue to gynecology or to surgery. Meantime, the great ovariologists and hysterectomists of Great Britain show, neither in their history nor in their renowned progress, any more special connection with or devotion to obstetrics and gynecology than do their purely surgical colleagues. They seem disposed rather to fall into general surgery than to adopt gynecological surgery. Much has been said of the special adaptation of obstetricians and gynecologists to their special departments of surgery, and a little force may be permitted to this argument in favor of gynecologist's claiming to themselves the field of gynecological surgery. But there is only a little force in it; there is only one set of surgical principles. One man may find it suit his genius to devote himself to the eye, another to the ear, another to the bladder, another to the ovaries, another to the uterus. But it is not necessary to hand over the surgery of the liver to a Murchison, or of the uterus to an Arthur Farre, or of the lungs to a Williams.

The reviewer of modern gynecological literature must express his admiration of the zeal and the diligence of the students and the consequent copiousness of the production; and undoubtedly the best is from Germany. The *Archiv für Gynaekologie* is a repertory of gynecological science, hitherto not approached in excellence by any other production, and is fit to be proudly placed beside any other scientific journal of the world. But we must look at the second-rate and the more bulky, as well as at the first-rate and more condensed, and we are bound to notice the failings.

It is almost needless to remark, that the more of science and the more of scientific method, the better the literature. Without truth there is no science, and without love of truth there is no scientific method. In gynecology there are lamentable aberrations from truth, inexcusable, not even to be palliated, and scarcely to be mentioned.

Quite in a different category are erroneous assertions, foolish exaggerations, and bad science. The world lives on theories, and bad science implies bad practice. Without truth there can be no science; without high morality there can be no good practice, and little progress in practice. Morality, accuracy, and good science must, therefore, be fostered as the bases of good practice. If examples of foolish assertion and bad science are wanted, we have only to refer to the history of "ulceration," with its speculums and caustics, now happily shrivelled into just proportions. Or we may refer to the history of displacement and the ridiculous spurious epidemic of displacements and of pessaries. Or we may look at the injury to women, apparently already half averted, from trachelorrhaphy, founded on such absurd statements as that at least one-half of

the ailments among those who have borne children are to be attributed to lacerations of the cervix. Or we may turn to the cures by oöphorectomy and by the Weir Mitchell method; to a very great proportion of which the cynical yet true remark may be applied—the women had no diseases and they were cured. “*Quidquid delirant reges, plectuntur Achivi.*” To think on these matters does not cause pain and indignation such as are excited by the previous category, but it causes sadness, and stimulates the desire to improve gynecological science and practice.

A third category demands consideration, and even respect, on account of its imposing character. We have said that the world revolves on theories; and the more general the principle involved the more important are the dependent theories. Long looking for a philosophical basis for the facile adoption of practices, dangerous out of due proportion to the dangers of the relative diseases, we failed to find any, however much we might shrewdly suspect its existence. At length, in a transatlantic address, it made its appearance from the mouth of an eminent gynecologist. It consists in the asserted importance, if not even the paramount importance, of pain as compared with life; or, in other words, for the relief of continued suffering, a considerable proportion of lives of the sufferers may justly be sacrificed.

An analogous question has been raised in regard to operations of complaisance—that is, for conditions involving no danger to life, and has been discussed by Velpeau. Such operations are for the removal or diminution of deformity and disability, and their establishment has been deliberately sanctioned or forbidden under the venerable principle, that life is of higher value than anything else.

The extension, in our times, of dangerous operations of complaisance and of dangerous operations for relief of pain, is, of itself, almost sufficient evidence that the stringency of the principle is not felt now as it once was. And it is for medical philosophy to decide as to the propriety of this loosening of the venerable restriction.

Justice demands the execution of individual criminals; statesmen send their fellow-countrymen to death in hosts; but, in these cases, there is solemn public judgment, and the nature of the objects aimed at is quite different from that of the aims of medicine. The judge and the statesman look to the interests of the public; the surgeon to the interests of the individual alone.

The obstetrician is permitted, on his own responsibility, to destroy foetal life. In most cases there is the preliminary question, easily solved, of the comparative value of the two lives, that of the foetus and that of the mother. This being settled, the obstetrician may, unchallenged, destroy foetal life to save maternal life. When the decision is not simple, both the profession and the lawgivers look upon destruction of life with the utmost jealousy. It may be remarked that there is, at present,

a strong and widespread fear that, even within professional circles, sufficiently jealous guardianship of embryonic and foetal life is not duly maintained, and, in passing, we may express our feeling of debt to Goodell for his eloquent remarks on this subject in a recent lecture.

Surgery has to consider individuals only, and is still generally held bound to act under the old-established principle of the paramount value of life. But there are many difficulties, for danger is a matter of degree, and diseases and individual cases have great difference in respect of danger to life.

All operations are dangerous to life; and we have no scale of the danger of diseases and the correlated justifiable danger of the relative operations. But such a scale has already some beginnings, and we do not despair of reaching valuable approximations in precise numerical form.

In most cases there is, fortunately, no difficulty. It is easy to decide in favor of ovariectomy. It is easy to decide against oöphorectomy in most of the cases in which it is at present, or has recently been proposed. It is difficult to come to a decision in most cases of proposed hysterectomy, and we may refer to the records of experience by Thomas Keith for just remarks and wise counsel on this subject.

The physician may have an easy decision to insist on operation, or to insist against operation; and in such circumstances he is content to stand alone. But, in cases of difficulty, he may often, with advantage, lay the question before his patient for her opinion, and be even content to let it be decided by the patient.

The preceding remarks are made with reference, exclusively, to the saving of life. But now we have to consider the new doctrine of the value of pain, and we find ourselves in insurmountable difficulties, solved only by recurrence to the old and venerable and safe principle of the value of life.

If pain becomes the test, then the patient, not the physician, is the judge. If pain is the test, then any case may be operated on. Who will define pain for this purpose? Who will define endurance? Who will prescribe just limits of endurance? Who will skilfully detect those

“ Opprest by some fantastic woes,  
Some jarring nerve that baffles their repose,  
Who press the downy couch while slaves advance  
With timid eye to read the distant glance;  
Who with sad prayers the weary doctor tease;  
To name the nameless ever-new disease;  
Who with mock patience dire complaints endure,  
Which real pain and that alone can cure?”

The recent progress of gynecology has been mainly surgical. Much has been done in gynecological pathology whose practical application in

relief of suffering or management of disease is of great value, and of wide applicability, but the triumphs of surgery, though comparatively limited in utility, engross the general gaze. This gynecological surgery does not stand isolated, but forms part of general surgical progress, and some leaders in the gynecological department, as Mr. Lawson Tait, perform exploits on the male, and in regions remote from those of gynecologists.

We have spoken of surgical progress and also of surgical license, and dismiss the latter with the remark that, if the motive is pure from selfishness, there is only a little room for rebuke. A generous surgical enthusiasm is like any other, attracting admiration as it pursues its boisterous career, although here and there it overflows the limits of sobriety. The main current is beneficent, and time will soon bring moderation and the stoppage or withdrawal of the overflowings.

Generous ambition, and fair rivalry, and the spirit of the times, have given the impetus to the accelerated progress of gynecological surgery. Here, and in all we have written, we regard only the great doings, the real progress, with its errors of enthusiasm. But the spirit of the times has thrown to the surface much else of surgery, included under the designation of minor gynecology. Of this there is not a little that is praiseworthy, but not enough to call for a laudatory review. The good is overwhelmed by the fussy residue, which has its natural and full and longed for equivalent in copiousness of filthy lucre. The child and the parent of crude physiology and cruder pathology, it delights in new tools and new remedies, or remedies with new names; speculums, caustics, pessaries, pads, and metrotomes, all of never-ending variety, meddling and muddling; inventing and making cures; exciting the disdain of the nobler brethren; a frivolous theme scarcely worthy of the pen of an able editor of a journal of the very latest Parisian fashions.

Recent gynecology, whether major or minor, owes much to the spirit of the times; but major gynecology has had powerful prospering favorable gales from recent discoveries. We may safely affirm, that without the anæsthetics of America, and the antiseptics of Lister, recent gynecological surgery could not have attained its great position. To foresee the danger unattended by the agony makes a ready, willing patient. To foresee the great source of danger, and to provide against it, embolden the surgeon.

Among the more adventurous spirits of gynecological surgery there is a risk of obliteration of the distinction between feasibility and advisability. They have proved that any operation is feasible, and now they have more difficult tasks; as, for instance, to show what operations are advisable, and how they may best be done, and when they may best be done. At what period in a case should ovariectomy be undertaken? Are there any cases besides those of uterine hemorrhage immediately



imperilling life in which the operation of Battey should be done? What are the cases in which hysterectomy should be practised for fibroids? What part should age take in favoring or discouraging operation in cases of hemorrhage? Is hysterectomy ever advisable in cases of cancer of the portio vaginalis, or in cases of cancer of the cervix? What are the limits of the use of hysterectomy in cases of cancer of the body? In what cases of extrauterine foetation is laparotomy to be resorted to, and when?

Major gynecology is too young to have laurels; its laudable zeal scarcely requires fostering. Minor gynecology requires pruning and direction, and even preliminary education, rather than fostering.

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## ON THE DILATATION AND HYPERTROPHY OF THE HEART, WHICH ARE NOT PRODUCED BY CHANGES IN THE VALVES.

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THAT all the examples of cardiac hypertrophy and dilatation which we meet with in practice are not due to valvular lesions, is a proposition which every one will admit. That attention has been called to such non-valvular cases by a number of authors is evident to any one who reads medical literature. And yet the recognition of these cases, and their treatment, have not become matters of ordinary practice. It has seemed to me, therefore, that it might be well to group together the cases of cardiac dilatation and hypertrophy not due to valvular disease; to subdivide the group into its appropriate classes; and to state the characteristics of each class.

With the information now available the following seems to be the most convenient classification:

1. Hypertrophy and dilatation due to excessive and prolonged muscular exertion.
2. Hypertrophy and dilatation due to morbid changes in the lungs.
3. Hypertrophy and dilatation associated with the infectious diseases, with anæmia, and with pregnancy.
4. Hypertrophy of the left ventricle with lesions of the arteries.
5. Hypertrophy of the left ventricle with cardiac neurosis.
6. Dilatation of the ventricles with inflammation or degeneration of the walls of the heart.
7. Dilatation of the ventricles occurring without discoverable cause.

1. HYPERTROPHY AND DILATATION DUE TO EXCESSIVE AND PROLONGED MUSCULAR EXERTION.—Our knowledge of this form of cardiac

lesion has been largely obtained from observations on soldiers. Da Costa<sup>1</sup> has described this condition, as it existed in the soldiers during the late civil war, under the name of "irritable heart." The clinical history begins, he says, with a diarrhœa, or a continued fever, or prolonged marches. After the previous existence of these conditions the patients begin to have dyspnœa on exertion, palpitation, and pain over the heart. After a time the heart becomes hypertrophied, rarely only dilated. He believes that most cases are amenable to treatment, and that the hypertrophy may diminish.

W. C. McLean<sup>2</sup> says that a large number of cases of hypertrophy and dilatation without valvular lesions are produced in soldiers by long marches, and the pressure of their dress and accoutrements.

Fraentzel<sup>3</sup> gives 19 cases in soldiers: 10 of hypertrophy and dilatation of the left ventricle, 2 of hypertrophy and dilatation of the right ventricle, 3 of hypertrophy and dilatation of both ventricles, and 2 of dilatation of both ventricles. The clinical symptoms were those of feeble and irritable heart. All the patients went through the campaign of the Franco-German war, and developed the cardiac symptoms afterwards.

The same changes in the heart have been described by a number of authors as the result of overexertion in civil life, especially among the laboring classes. T. Clifford Albutt<sup>4</sup> says that the cardiac affections due to physical strain are obstinate irritability and dilatation of both ventricles with or without hypertrophy. Fothergill<sup>5</sup> mentions excessive labor with the arms and in constrained positions in workingmen as causes of dilatation and hypertrophy. In runners and gymnasts he has found dilatation and hypertrophy of the right ventricle. Quain<sup>6</sup> calls attention to the effect both of severe muscular exertions and of violent emotions in producing dilatation and hypertrophy of the heart. Peacock<sup>7</sup> says that the heart is liable to be overstrained from overwork, long-continued hard work, or sudden violent efforts. The cavities become dilated, and the valves incompetent.

J. Seitz<sup>8</sup> has written at considerable length on this subject, and cites twenty-five cases, thirteen of which were his own. Most of the patients were males and hard workers. All were well previous to the overwork; all were improved by rest, and the symptoms returned in all on the least exertion. In most of the cases a murmur, which was sometimes taken for a pericardial or endocardial murmur, was present. He thinks that this murmur is due to the rubbing together of the opposed surfaces of

<sup>1</sup> Memoirs of U. S. Sanitary Com., p. 372; The American Journal of the Medical Sciences, 1871.

<sup>2</sup> British Med. Journ., 1867, p. 161.

<sup>3</sup> Virch. Arch., lvii. p. 215.

<sup>4</sup> Med. Times and Gazette, 1873, p. 290; St. George's Hosp. Rep., 1870.

<sup>5</sup> Diseases of the Heart. London, 1880.

<sup>6</sup> Lumleian Lectures, Med. Times and Gazette, 1872, p. 352.

<sup>7</sup> Med. Times and Gazette, 1873.

<sup>8</sup> Deutsche Arch. f. klin. Med., xi. and xii.

the uninflamed pericardium, or to the enlargement of the opening of the mitral valve, and the consequent insufficiency of the valve.

The clinical picture was that of cardiac weakness, with symptoms referable both to the heart and to the accompanying disturbances of the circulation. In the larger number of the cases, although the symptoms might be alleviated for a time by rest, yet the course of the disease was from bad to worse.

It is a matter of ordinary observation that the repeated training employed in some athletic exercises leads in some individuals to hypertrophy of one or both ventricles. There seems then to be no doubt that prolonged and excessive muscular exertion may produce a well-marked change in the rhythm and size of the heart without lesions of the valves or changes in the structure of the heart wall. In some of the cases the rhythm alone is disturbed; the patients have an irritable heart without any marked change in its size. In other cases in addition to the irritability there are also dilatation and hypertrophy of one or both ventricles, and in some of these cases are added the symptoms due to venous congestion in different parts of the body. In still other cases, although the heart is enlarged, there is no change in its rhythm, and it does not trouble the patient.

2. HYPERTROPHY AND DILATATION DUE TO MORBID CHANGES IN THE LUNGS.—Rokitansky<sup>1</sup> says that increase in the density of the lungs, destruction of the lung-tissue and its capillaries, and any obstruction to the emptying of the pulmonary veins may produce changes in the right heart. Deformities of the chest, pleuritic effusions, emphysema, interstitial pneumonia, and bronchiectasæ are the ordinary causes of such changes in the lungs.

W. T. Gairdner<sup>2</sup> believes that nine-tenths of all cardiac hypertrophies, independent of valvular disease, are caused by diseases of the lungs.

Stokes<sup>3</sup> finds that dilatation of the heart is most frequently produced by diseases of the lungs and by atheromatous arteries, and is apt to occur in persons who have the gouty diathesis. He has seen no case of simple dilatation not associated with lung or liver disease.

Munzinger<sup>4</sup> gives an account of fifty autopsies of cardiac cases, in forty-two of which there was no valvular disease. He found that disturbances of the lesser circulation produced lesions of the right ventricle, and those of the aortic system lesions of the left ventricle. In workingmen, emphysema of the lungs and dilatation and hypertrophy of the right ventricle of the heart develop side by side. These persons have insufficient food, mostly composed of carbohydrates and liquor; they make great and continuous exertions; they lift and carry heavy weights, run up and down hill, etc. They develop cyanosis, œdema, dyspnoea, a curved back,

<sup>1</sup> Path. Anat., vol. ii. p. 259.

<sup>3</sup> Diseases of the Heart.

<sup>2</sup> Med.-Chir. Rev., July, 1853.

<sup>4</sup> Arch. f. klin. Med., 1877, p. 448.

round shoulders, and anæmia. The heart's impulse becomes diffuse and scarcely visible, and a mitral systolic murmur can be heard. It is the combination of bad food, overexertion, and alcohol which produces at the same time emphysema of the lungs, dilatation of the right and then of the left ventricle, and a feeble heart.

Baümle<sup>1</sup> gives several cases of dilatation and hypertrophy of both ventricles with old pleuritic adhesions and chronic bronchitis. Barlow<sup>2</sup> describes cases of dilatation of the right ventricle with pleuritic adhesions and phthisis.

Altogether the most frequent cause of such changes in the heart, however, is emphysema. The development of the dilatation and hypertrophy first of the right and then of the left ventricle seems to be dependent not on the degree of dilatation of the air spaces, but rather on the interstitial changes in the lung which belong to substantive emphysema. For this reason I imagine that some cases of heart disease due to emphysema are not properly classed, the dilatation of the air vesicles not being very marked. In the more marked examples of emphysema and ventricular dilatation the disturbances of the circulation, and consequent symptoms, are as bad as in the worst cases of valvular disease. The following case is a fair illustration of the course of the disease in many patients.

A male aged 48, had suffered from winter cough for twenty years; for five years dyspnœa on exertion became constantly more annoying; for the last three months the cough and dyspnœa have been much worse; for the past two weeks rapid loss of flesh and strength, dropsy of the legs, scanty urine, orthopnœa, and finally death, with extreme dyspnœa and cyanosis. At the autopsy the lungs presented the lesions of emphysema and bronchitis, the right ventricle of the heart was hypertrophied, the liver, spleen, stomach, intestines and kidneys were in the condition of chronic venous congestion.

3. HYPERTROPHY AND DILATATION ASSOCIATED WITH THE INFECTIOUS DISEASES, WITH ANÆMIA, AND WITH PREGNANCY.—The changes in the ventricles in infectious diseases have been noticed by many observers. M. A. Fabre<sup>3</sup> says that in typhoid fever there is a myocarditis affecting the papillary muscles, followed by incompetency of the mitral valves and dilatation of the left ventricle.

Friedreich<sup>4</sup> mentions a form of dilatation aside from valvular disease or fatty degeneration, which results as a lack of tonus in the heart muscle in the course of puerperal fever, pyæmia, typhoid and typhus fevers. While it is not doubted that an acute parenchymatous change may take place, still, under the above conditions, atonic relaxation and dilatation may simply result.

<sup>1</sup> Arch. f. klin. Med., xix. p. 471.

<sup>3</sup> Gaz. des Hôpit., 1877, p. 1083.

<sup>2</sup> Guy's Hosp. Rep., 1859, p. 349.

<sup>4</sup> Krankh. d. Herz.



Von Dusch<sup>1</sup> says that dilatation has its etiology in the heightened cardiac pressure on the ventricular wall during systole and a diminished elasticity of the walls. The relaxation has its origin in granular degeneration in the infectious diseases.

Goodhart<sup>2</sup> and Barlow<sup>3</sup> describe cases of acute dilatation of the left ventricle as causes of death with scarlatina and dropsy.

Friedländer<sup>4</sup> believes that in nephritis with scarlatina it is the rule to have hypertrophy of the heart combined with dilatation. The hypertrophy results not only from the effects of the scarlatinal poison, but also from the nephritis; it is due to obstructed capillary circulation, diminished secretion of watery elements, and retention of excrementitious matters. When the heart muscle through the scarlatinal poison, the anæmia, or the vomiting, becomes functionally injured, then acute dilatation results. After the urine has become diminished the heart's impulse is spread over a greater area, and the dilatation is ushered in by a murmur both when hypertrophy or dilatation is produced.

It seems evident that dilatation of the heart in typhus and typhoid fevers belongs to some epidemics and not to others, and that it depends principally on the changes in the ventricular wall. In scarlatina, on the contrary, it seems probable that the changes in the heart are principally due to the obstructed circulation in the bloodvessels.

Anæmia is generally recognized to be a cause of enlargement of the heart, both in the temporary anæmia of young women, and the persistent anæmia of pernicious anæmia, leukæmia, etc. It is usually ascribed to the feebleness of the muscles of the heart wall.

Pregnancy is said to be accompanied by hypertrophy of the heart by some authors,<sup>5</sup> but this is denied by others.

4. HYPERTROPHY OF THE LEFT VENTRICLE WITH LESIONS OF THE ARTERIES.—Hypertrophy of the left ventricle is frequently seen with endarteritis of the aortic system, involving either the aorta alone, or the larger arteries also. The general thickening of the walls of the smaller arteries, which is so frequently associated with the atrophic form of chronic Bright's disease is regularly attended with hypertrophy of the left ventricle. When this same condition of hypertrophy of the left ventricle is developed with chronic nephritis without actual disease of the arteries, it seems probable that the unnatural contraction of the smaller arteries may have the same mechanical result.

A congenital narrowing of the aortic system with well-marked dilatation and hypertrophy of the left ventricle, has been described by a number of authors.

<sup>1</sup> *Lehrb. d. Herzkrankh.*

<sup>3</sup> *Med. Times and Gazette*, 1880.

<sup>5</sup> Lardner, *Arch. Gén.*, 1859. McDonald, *Heart Disease during Pregnancy*. Cohnstein, *Virch. Arch.*, 77, p. 146.

<sup>2</sup> *Guy's Hosp. Reports*, xxiv. p. 153.

<sup>4</sup> *Caust. and Virch. Jahrb.*, 1878.

5. HYPERTROPHY OF THE LEFT VENTRICLE WITH CARDIAC NEUROSIS.—The most frequent examples of this condition are furnished by exophthalmic goitre. In this disease the increased rapidity of the heart's action is regularly followed by hypertrophy of the left ventricle.

A certain number of cases of palpitation of the heart, associated with a variety of causes, are followed after a time by enlargement of the heart. This enlargement is sometimes attended with increased force of the heart's action; in other cases, on the contrary, the rhythm of the heart is irregular and feeble.

6. DILATATION OF THE VENTRICLES WITH INFLAMMATION OR DEGENERATION OF THE WALLS OF THE HEART.—This form of dilatation seems to be due either to pericarditis, to interstitial myocarditis, or to fatty degeneration.

With severe pericarditis and the formation of extensive adhesions, either one or both of the ventricles may become dilated and hypertrophied. With interstitial myocarditis the dilatation is sometimes general, sometimes circumscribed and aneurismal. With fatty degeneration the heart, although often small, is sometimes enlarged, the ventricles are dilated and their walls thinned.

7. DILATATION OF THE VENTRICLES OCCURRING WITHOUT DISCOVERABLE CAUSE.—This seems to me the most interesting of this entire group of cardiac cases. The cases are not at all uncommon; they are met with in ordinary practice, and their nature and causation are very obscure. I include in this set of cases some of those which are said to result from sudden emotions and sudden exertions, and some of those said to have been fatty. None of these can be considered satisfactory causes; and in other similar cases no such conditions existed.

On account of the clinical importance of this group of cases and the moderate number which have been recorded, I shall give a number of examples in detail.

CASE I., R. Thompson.<sup>1</sup>—A laborer, aged twenty-three, six days before admission, after work, suddenly experienced pain below the liver; tormina, collapse, orthopnoea, vomiting, small rapid pulse, no cardiac murmur. At the autopsy the heart was found to weigh eighteen ounces; both ventricles were dilated; the valves were not diseased; the muscular tissue of the walls of the ventricles was pale and fatty.

CASE II.—A male, aged twenty-eight, on lifting a heavy weight became suddenly ill; pain over the heart; hæmoptysis; vomiting; systolic murmur at the base; pulse 108; apex beat in the sixth interspace. At the autopsy both ventricles were found to be very much dilated; their walls thin; no lesion of the valves; venous congestion of the liver, spleen, and kidneys.

CASE III., McDowell.<sup>2</sup>—A female, aged twenty-three, suffered for fifteen months from cardiac palpitation, hæmoptysis, dyspnoea, bron-

<sup>1</sup> St. George's Hospital Reports, 1870, p. 119.

<sup>2</sup> Dublin Med. Journ., 1852, p. 352.

chitis; heart irregular and dilated; systolic murmur; general dropsy. At the autopsy the left ventricle was very much dilated; the valves healthy; the heart muscle of pale brown color.

CASE IV.—A female, aged sixty-three, suffered with cyanosis, dyspnoea, systolic apex murmur, irregular heart action. At the autopsy there was found dilatation of both ventricles, without valvular disease.

CASE V.—Moxon<sup>1</sup> relates a case of acute dilatation of the heart, which followed excitement during sexual intercourse. There was found after death dilatation of the left ventricle without ventricular lesions.

CASE VI.—Latham<sup>2</sup> gives a case of a man who ran violently against another person, and subsequently developed palpitation, anasarca, and died with enormous dilatation and hypertrophy of the heart, without valvular disease.

CASE VII.—He also cites the case of a man, who in a paroxysm of rage was forcibly restrained, and subsequently developed cardiac dilatation and dropsy, without valvular lesions.

CASE VIII., Delafield.—A male, aged twenty-six, a farm laborer, was perfectly well until thirteen months before his death. Then, without known cause, he had an attack of oppression in the epigastrium, followed by loss of consciousness and clonic spasms. After half an hour vomiting commenced and lasted several days. Since then he has had four similar attacks at intervals of from two weeks to six months. No cough, dyspnoea, palpitation, or dropsy; but has not been strong enough to work since his first attack. During the last month of his life he had four attacks, each characterized by temporary unconsciousness, persistent vomiting, and pain in the epigastrium; very irregular heart action, the pulse varying from 27 to 190; the heart gave the physical signs of dilatation without murmur. At the autopsy both ventricles of the heart were found very much dilated, without valvular disease. All the viscera were in the condition of venous congestion.

CASE IX., Delafield.—A male, aged twenty-six, a gardener, was perfectly well until three weeks before his death. Then, while lifting a wheelbarrow, he was suddenly seized with dyspnoea. The dyspnoea continued, and was very severe and constant up to the time of his death. The heart was much dilated, its rhythm was very irregular, there was no murmur. After death both ventricles were found to be very much dilated, no change in the muscle of the heart walls, nor in the valves. There was venous congestion of the viscera and dropsy of the venous cavities.

CASE X., Delafield.—A male, aged thirty, a shoemaker, had been troubled for a year with cough and occasional vomiting. Four months before his death dropsy began, and continued. The heart's action was feeble and irregular, there was no murmur. Both ventricles were found dilated, without valvular lesions, or changes in the muscular tissue.

CASE XI., Delafield.—A male, aged twenty-seven, a driver; says that twelve weeks before his death he caught cold and began to have a cough, dyspnoea on exertion, and pain in the epigastrium. Seven weeks before his death he presented the physical signs of dilatation of the heart, without a murmur. He continued to have dyspnoea, developed general anasarca, and died. There was dilatation of both ventricles without valvular disease, and chronic venous congestion of most of the viscera.

<sup>1</sup> Med. Times and Gaz., 1871.

<sup>2</sup> Diseases of the Heart, 1876, p. 351.



CASE XII., Delafield.—A male, aged forty-two; about five months before his death began to have dyspnœa, palpitation, cough, and mucous expectoration. The dyspnœa continued, dropsy developed, and he died. Both ventricles were much dilated, the heart muscle was not degenerated, the valves were healthy. There was venous congestion of most of the viscera.

CASE XIII., Delafield.—A male, aged forty, said that he had been strong and well until four weeks before his death. Then he suddenly developed extreme dyspnœa so that he had to stop work. The heart's action was rapid and feeble, but there was no murmur. The dyspnœa continued to be most severe up to the time of his death. Both ventricles were dilated, their endocardium was a little thickened, there was a growth of connective tissue between the muscular fibres, with degeneration of the fibres. The aorta presented the lesions of chronic endarteritis. The viscera were congested.

CASE XIV., Delafield.—A male, aged fifty-three; eleven months before his death began to have dropsy of the legs. He lost appetite, flesh, and strength, and the dropsy increased. Then he developed dyspnœa, palpitation, precordial pain, cough with bloody sputa, and vomiting of blood. The heart's action was rapid and feeble, it was dilated, there was a mitral systolic murmur. Both ventricles were much dilated, without hypertrophy, there was a little old thickening of the aortic and mitral valves. The kidneys were examples of the atrophic form of chronic Bright's disease. The lungs were emphysematous.

It is doubtful whether or not this case belongs with this group.

CASE XV., Delafield.—A male, aged forty, suffered for seven weeks from general prostration, cough, great dyspnœa, and constant hæmoptysis. Both ventricles were much dilated, the valves were normal, there was a moderate growth of connective tissue between the muscular fibres of the heart wall. The viscera were congested.

CASE XVI., Delafield.—A male, aged sixty, a grocer; about eight months before his death suddenly developed dyspnœa and dropsy of the legs; these symptoms continued for three months, then he improved until three weeks before death. The dyspnœa became urgent, there was cyanosis, the heart was dilated, its action was feeble and irregular, there was no murmur.

After death both ventricles were found much dilated, there was a little old thickening of the aortic and mitral valves; the viscera were congested.

The cases which I have narrated are evidently not all of exactly the same character, but yet they constitute a convenient clinical group. In most of them no cause at all for the cardiac lesion could be discovered; and in those cases in which there was a history of sudden exertion, or mental emotion, or of change in the wall of the heart, these conditions do not seem at all adequate to explain the cardiac lesion.

Most of the cases were males, and many of them young adults. The invasion of the symptoms was sudden in seven cases, gradual in five, and in three was not stated. The disease ran in some cases an acute, in others a chronic course. In my own cases the shortest period was twenty-four days, the longest fifteen months. The heart's action was



irregular and feeble, the physical signs of dilatation were evident, in some of the cases there was a systolic murmur, in others none. The dyspnœa was in most of the cases a marked symptom. I have never seen more distressing dyspnœa than that which existed in some of my cases. Dropsy was developed in the more protracted cases, but not in those of shorter duration. The urine in the cases which I have seen was diminished in quantity, the specific gravity from 1.010 to 1.026, there was no albumen present, or but very little. The dilatation regularly involved both ventricles, and hypertrophy was the exception.

The lungs, liver, stomach, spleen, and kidneys regularly presented the condition of chronic congestion which belongs to marked valvular lesions of the heart.

The course of the disease was from bad to worse, and even the symptoms were but little alleviated by treatment.

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SOME OBSERVATIONS  
ON THE THEORY OF BRONCHIAL ASTHMA,  
VIEWED IN THE LIGHT OF THE PATHOLOGY OF HAY FEVER.

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No one who has studied carefully that most admirable treatise of Dr. Blackley on hay fever can justly doubt the general accuracy of his conclusions concerning its causation; and no one can fail to admire both the careful manner in which he has conducted his clinical inquiries and experiments, and the judicial caution which he has exercised in dealing with the results of them. Nevertheless, whilst he has proved conclusively that, *within the range of his experience*, the majority of cases of hay fever are produced by the action upon the nasal mucous membrane of the pollen of certain cereals and grasses, he has not, with adequate clearness and strength, set forth the facts that hay fever may arise from different causes, and at seasons other than the season in which pollen is produced and diffused throughout the air. Further, it is a curious fact that among all the recorded subjects of this disease it is found to be least common among those who are most exposed to the action of pollen. Gardeners, farmers, and agricultural laborers seldom suffer; whilst young men and women of culture in the higher ranks of society are its most common victims. To bring to light the true cause of this malady, to unravel its relations to maladies resembling it, and to get hold of the

right principles of treatment, it will be necessary to consider those cases of the disease arising in circumstances which practically exclude the possible action of pollen upon the mucous membrane.

Hay fever occurs in winter or spring; sometimes it occurs at sea or in the heart of a great city; sometimes, when no pollen can be found in the air, it arises after a full meal, or in the middle of the night; sometimes it appears almost instantaneously under the influence of intense light, the heat of a great fire, the odors emanating from certain localities, plants, and animals; some particular place or position occupied in driving; or from emotions and vivid ideas. In these and in all like cases there are clearly two main factors at work, a certain local or constitutional predisposition, and some immediately acting exciting cause. That some such predisposition exists is plainly proved from the fact that the exciting agents which produce the malady in one class of persons entirely fail to produce it in another; and that these exciting agents, in their relations to the persons acted upon by them, are in a remarkable manner specialized seems also proved by the circumstances that the emanations from a stable which in one person provoke a severe attack, produce in another, liable to hay fever, no sensible effect. And of the persons subject to this disease, it must be said that they are not always affected in the same manner by the same agent; for sudden intense light which may bring on an attack at one time will quite fail at another; and so we are compelled to conclude that the organism, or some particular part of it, varies so much in its conditions that its relations to its environments are capable, without sensible structural alteration, of becoming completely changed.

When we inquire into the family and personal history of an individual subject to hay fever, we shall discover as the prominent point in it that the patient and his people are more or less "neurotic." There may be found among members of the patient's family the disease of which he is himself the subject, gout, such skin troubles as urticaria and eczema, migraine, neuralgia, epilepsy, and no inconsiderable sprinkling of pulmonary disease. But that which will be found the most widely, and will connect them all, will be a sensitive, an irritable, and an unstable nervous system.

When we pass from the family to the individual, and examine in him the character of his general health and the assemblage and progression of phenomena which together constitute an attack of hay fever, we shall be compelled to admit that the prime agent therein, the agent which underlies, originates, develops, and regulates the phenomena is a nervous agent. And although this nervous agent, or, more correctly, this nervous state, is not always and everywhere manifest throughout the nervous system, it is always manifest, or capable of manifestation, within the area of the parts affected.

Some patients allege that they are made aware of the approach of an attack of hay fever by experiencing for a day or two feelings of great elation, or of great depression. Probably this means nothing more than that the nervous system has been brought by indifferent causes into an unstable condition, in which its liability to become affected by the exciting agents of the malady is greatly increased. At any rate, constitutional prodromata are neither usual nor necessary, since for the most part the attack follows almost instantaneously the application of its common causes.

The order in which the symptoms of hay fever appear, the character, subjective and objective, which they assume, the course which they follow, the time which they last, and the manner in which they end, vary in different persons, and in the same persons at different times. But the usual way in which the phenomena arise, advance, decline, and terminate may be thus described. First of all, over the forehead, in the eyes, about the ears, in the hard palate, or throughout the upper part of the nose, both inside and out—in one or in several of these places together—there is experienced a sensation of fulness or tightness. This is succeeded by sensations of itching, formication, tingling, pricking, and more or less numbness or soreness. Then the mucous membrane of the special sensory part of the nose begins to swell, becomes coated with a viscid, irritating mucus, and finally closes the nasal passages to the entrance of air. Meanwhile the eyelids become puffed; and the ocular and palpebral conjunctiva, as well as the mucous membrane of the pharynx, exhibit swellings resembling, except in their smaller size, urticarial wheals. The whole region implicated in the affection feels stuffed and tight, or drawn and numb. Now, or earlier, irregular and sometimes violent sneezing sets in; a feeling of oppression is experienced in the throat and chest, and at last relief is obtained through a profuse secretion of more or less limpid serum, or of watery mucus, from the nose. When there is also a flow of tears the sense of relief is augmented; but the augmentation is a doubtful good, since the tears, altered in character, irritate and sometimes erode the surfaces over which they travel.

With a continuing secretion the swelling of the nasal mucous membrane subsides, air enters freely through the nasal passages, the oppression of chest disappears, the attacks of sneezing become less frequent and violent, and the patient expresses himself lightened and relieved.

After removal of the viscid mucus, which appears at the earlier stage of the attack, the flow from the nasal mucous membrane consists of a limpid serum, or of a watery mucus; and in both instances the fluid contains, in addition to epithelial cells, blood-disks, and hyaline globules, crowds of lymph-cells in the active changes of advancing and regressive growth. Microorganisms of various kinds are also present in great

abundance; but I have discovered no reason to suspect that they hold any causal relation to the disease. At a later period the discharge becomes mucopurulent, and more or less mixed with blood; and the nasal mucous membrane may be seen upon examination to be studded with bloody points, minute ash-colored patches, and small superficial erosions.

Attacks of hay fever arising independently of pollen may be continuous, and become in a sense chronic; they may remit or intermit, or they may come and go quite irregularly, and without apparent cause. In exceptional cases they appear, with some regularity, just before the advent of menstruation.

Although in the course of an attack of hay fever the patient is sometimes distressed by painful sensations, it is seldom that there is any grave constitutional disturbance. Occasionally, however, an event does happen which not only produces alarming symptoms, but which, critically examined, leads to a clearer and juster apprehension than we generally possess of the pathology of bronchial asthma.

In a patient suffering from hay fever, it happens now and then that all the nasal symptoms cease, and that in place of them there arise, sometimes suddenly, sometimes slowly, all the signs and all the symptoms of an attack of ordinary bronchial asthma. More rarely the affections alternate, and there is established a more or less regular see-saw between the nasal and the bronchial troubles. And the more closely and critically one examines them, the stronger grows the conviction that they possess the same hereditary, constitutional, and local alliances, that the same structural changes exist in both; that the same causes operate in their production; that they follow the same courses; that eventually they have the like issues; and that the differences to be found in their effects are to be explained by the difference of the parts affected and the widely different importance of their respective functions in the economy. If all this be true, if it be true that hay fever is a neurotrophic vascular disease, if it be true that all the essential facts of this malady find an adequate and a complete explanation in the hypothesis of a nervous origin of the affection, and if it be also true that we should admit no more cause of a thing than those that are both true and sufficient, why should we not consider bronchial asthma to be the same disease as hay fever, and why should we invent unnecessary and unphysiological explanations of phenomena otherwise to be accounted for by demonstrable facts?

It is alleged that the asthmas—the asthma connected with hay fever and the asthma which is not—are two very different affections. But the grounds for the allegation are untenable, and have been taken on the assumption that the action of pollen upon the nasal mucous membrane is the exclusive cause of hay fever. But I contend that other external agents are capable of producing this malady, and that some-



times it is provoked by disorders engendered within the system itself. If such be the case, there is neither force nor meaning in the saying that the one arises in the night and the other in the day; that the one occurs in the house, the other in the air; that the one is due to the inhalation of pollen and the other not; that in ordinary asthma the attacks appear at any time, and alternate with long intervals of perfect health, and that in hay fever the attacks occur only in summer, and last as long as the pollen remains diffused in the atmosphere. But we may justly go much further than we have gone in advocating the unity of the two affections. We may contend that whilst neurovascular swellings, like those of hay fever, more or less suddenly coming and going in the mucous membrane of the air tubes would afford a true and adequate explanation of the phenomena of ordinary bronchial asthma, the main theory now in vogue respecting it is neither the one nor the other.

This theory is that asthma is a primitive substantive disorder, not necessarily connected with organic disease, and that it is due to spasmodic contraction of the bronchial muscles and its effects.

Upon the other theories of asthma, that it is a mere neuralgia of the vagus, that it consists of a group of symptoms due to various kinds of structural alterations, that it depends upon temporary paralysis of the expiratory muscles, and that it is essentially a tetanic contraction of the great muscles of inspiration, I shall not now dwell.

In favor of this "spasm theory" of asthma, which we owe to Williams, Gairdner, and Bergson, it is contended that it is adequate to the explanation of the facts of the disease; that it conforms to our present physiological and pathological knowledge; that it is the only possible explanation of the paroxysm; and that it is beyond both the possibility of cavil and the necessity of proof. These are brave words; and if it were, as it is not, that mere logic is the final measure and test of truth, much might be said in support of their bravery. We examine a man in a paroxysm of asthma; he is suffering from urgent dyspnoea. Leaning forwards upon his arms which are in a fixed position, he makes every conceivable effort to inspire, and every muscle of inspiration, ordinary and extraordinary, seconds his efforts. Upon his inspiration, which is labored, slow, and loud, he spends his available strength, whilst to his expiration, urgently needed to reduce his overdistended chest, he gives nothing. The chest is not only distended but tympanitic; the heart beats tumultuously, the pulse is small, feeble, frequent; a cold sweat bedews the skin; the countenance expresses anxiety and suffering. What is the cause of this dyspnoea? There is neither disease of the heart nor congestion of the lungs. It is not due to inflammation or to tubercle, for there is not a sign of either. It is not due to mere accumulation of mucus; for from the beginning to the end of the attack there may not be a spoonful discharged. It is not due to emphysema,

for the dyspnœa of that would be more or less continuous. It is a dyspnœa which is quite peculiar. Breathing is long-drawn, labored, slow, noisy, dry, coughless, and characterized by extreme difficulty of expiration, the convulsive efforts to inspire suggest the presence of some obstruction to the entrance of air. The absence in varying regions of the chest of the respiratory murmur shows that such obstruction exists, and that it is both temporary and shifting. Where is the obstruction? Not in the lungs, which are expanded to the utmost, and everywhere resonant on percussion. There is no tumor pressing upon the trachea or bronchi; no paralysis of the vocal cords. Certainly, then, the obstruction must be in the bronchial tubes. Listening to the chest, we soon learn that the cause of the obstruction is a stricture; for the almost noiseless passage of the air through the tubes is converted at a certain point into a noisy sibilant wheeze. What is the cause of this stricture? It is not mucus, for no expiratory force can dislodge it. It is not an inflammatory thickening, for it shifts and varies. Nothing remains to account for the phenomenon but constriction of the bronchial tube, produced by spasmodic constriction of the bronchial muscles. As you continue to listen the spasm relaxes, the sibilant râle ceases, the respiratory murmur returns. In another place, where the breath sounds are sufficiently normal, the whistling noise is suddenly heard, and in the lung beyond the respiratory murmur disappears. At various parts, in close succession, the same phenomena come and go. The demonstration is complete. The cause of the asthmatic paroxysm is shifting spasm of the bronchial tubes. If you wish, says Bergson, any further proof of the truth of this doctrine, give to the asthmatic, in the height of his paroxysm, a dose of chloral or a hypodermic injection of morphia and atropine, and he will be made free from suffering. Nothing but a bronchial spasm would so respond to such remedies.

Such is the rough presentation of the form of the argument employed in supporting the bronchial spasm theory of asthma.

Let us now examine the main points of this argument.

1. We have received from Williams and Bert conclusive proof that, under various stimuli, the bronchial muscles are capable of a slow and limited contraction, but we have no proof whatever that this contraction is of a kind, completeness, or quickness sufficient to account satisfactorily for all the local phenomena of the asthmatic paroxysm. Indeed, Paul Bert, to whom we owe the most conclusive proofs of the contractibility of the bronchial muscles, considers it to be quite inadequate to account for the dyspnœa now in question.

2. It has been proved by experiment that, when the chest is forcibly expanded, the bronchi contract only very slightly, or not at all. In the asthmatic paroxysm the thorax is strongly dilated, and it is in the highest degree doubtful whether in the face of the dilating force of violent

inspiratory efforts, there would occur any considerable contraction of the bronchial tubes.

3. The alleged spasms are most common where the circular muscles are least abundant. The walls of the terminal bronchi and of the earlier interalveolar passages are composed in great part of circularly arranged muscles, and are more compressible, as well as more dilatable, than the larger air tubes. Now, if spasm of the bronchial muscles be the essence of the asthmatic paroxysm, why does this spasm stop short at a particular part where the muscles are most abundant and most irritable? Why are the smaller tubes not contracted and closed? And, if they are contracted and closed, why is the chest dilated, instead of collapsed? Why are the lungs full of air? And why is there clearness of percussion, instead of dulness?

4. There is no proof forthcoming that the sounds heard in the chest during the asthmatic paroxysm are really due to constrictive spasms of the bronchial tubes. It may be conceded that those sounds suggest the idea of spasm, and that the patient's feelings testify to its existence; but, in a scientific inquiry, evidence of this sort, based upon impressions, and, to some extent, opposed to physical laws, may demand fresh search, but can have no permanent place or value.

5. In the asthmatic paroxysm the variation in pitch, and the sudden shiftings in place of the stridulous noises heard in the chest, accompanied by more or less complete hindrance to the entrance of air, seem to be incompatible with any just notion of the contractibility of the bronchial muscles, which is slow, persistent, and progressive.

From these and from other reasons not now set forth, I conclude that the bronchial spasm theory of asthma is either inadequate to explain the phenomena of the paroxysm, or is not in harmony with the present state of physiological and pathological knowledge.

If now we return to our study of the local phenomena of hay fever, we may find in them the grounds of an adequate expression of the phenomena of the asthmatic paroxysm and of a true theory of its nature. Let us remember that the various disorders of sensation which begin the paroxysm of hay asthma are followed by general or local swellings of the nasal mucous membrane; that these swellings rise and subside with great rapidity; that they are capable of completely occluding the nasal passages; that the air traversing them, when partially open, produces shifting stridulous sounds; that, when secretion occurs, it is either watery, acrid, and abundant, or scanty and mucoid or gelatinous; and that, toward the close of the paroxysms, the discharge becomes sometimes purulent and stained with blood. Let us remember, furthermore, that the end of an attack of hay fever is occasionally the beginning of an attack of bronchial asthma; that now and then the two affections alter-



nate; and that, although rarely, asthma, hay fever, and urticarial rashes are exchangeable troubles in the history of the patient and his family.

If now, making due allowance for anatomical differences, we suppose that the structural changes occurring in the nasal mucous membrane during an attack of hay fever were to occur also in various parts of the bronchial mucous membrane, would their presence there, going and coming, afford a complete and adequate explanation of the facts observed during a paroxysm of bronchial asthma? I am fully impressed by the conviction that they would; and that, furthermore, by the presence of those bronchial swellings and their immediate effects, we should become able to solve difficulties which, under the reign of the spasm theory, are regarded as insoluble.

It would certainly be interesting, and might be instructive, to set forth the grounds of this conviction through a critical examination of every separate sign and symptom of the asthmatic paroxysm. But I fear that neither the practical importance of the subject, nor the time at the disposal of my readers, would justify such a course. Happily, however, this end may be otherwise achieved, and at the cost of but a small sacrifice of material evidence. In the following series of propositions I shall endeavor to set forth as concisely as possible what I regard as the teaching of a study of hay fever concerning the pathology of bronchial asthma:

1. Asthma is a neurovascular trophic disease, and has its roots in a special vulnerability of the respiratory mucous membrane, of the respiratory nerve centres, and of certain portions of the sympathetic.

2. The irritation exciting the nerve discharges which bring about the asthmatic paroxysm may arise in the blood, in any one of the mucous tracts, but more particularly the respiratory one, in certain cutaneous inflammations, and in the central nervous system itself.

3. The paroxysm begins by a more or less diffused hyperæmic swelling of the bronchial mucous membrane, and is continued by the development at various parts thereon of circumscribed congestive swellings, which come and go with greater or less rapidity, and resemble, in many particulars, the swellings of the skin in nettlerash.

4. At their first appearance these swellings become coated with a viscid mucus, hinder the entrance and exit of air, and by their vibration produce for the most part the drier râles characteristic of a certain state of the asthmatic paroxysm. Toward the close of an attack, the swellings after free secretion subside, the dyspnœa is relieved, and moist take the place of dry râles.

5. The secretion from the swellings being sometimes acrid, and even corrosive, may excite some contraction of the bronchial muscles; but such contraction cannot become, either by its nature or its amount, the chief factor in the evolution of the asthmatic paroxysm.



6. The hyperæmia and circumscribed swellings of the bronchial mucous membrane hindering the free entrance of air, and thereby the full aëration of the blood, both the peripheral nerves and the respiratory centres are irritated, and exaggerated discharges of respiratory impulses are sent to the inspiratory muscles, which are thrown thereby into violent and sometimes even tetanic contractions.

7. These violent inspiratory efforts increasing the Hallerian extension force of the thoracic walls, straighten the bronchial tubes, and, notwithstanding the tendency of inspiratory forces to increase the size of the swellings, make the entrance of air into the lungs far easier than its exit.

8. When the inspiratory efforts cease, and the expiratory recoil begins and is continued by the muscles of forced expiration, the smaller bronchi, more especially those containing mucous wheals, are compressed, and all the passages are relaxed and lose their straight direction. Thus the egress of air is greatly hindered, and the act of expiration so much prolonged that it is sometimes suddenly interrupted and prematurely closed by the violent inspiratory efforts originated in the respiratory nerve centres through the circulation of imperfect oxidated and decarbonized blood. In this way inspiration gains upon the expiration; the alveoli are extended with air; the diaphragm is depressed; the chest, in all its dimensions, is dilated; breathing becomes more and more difficult; death seems imminent; and the paroxysm is at its height.

9. After a time, varying greatly in duration, the attack begins to subside, and, partly by secretion from the bronchial mucosa, partly from the exhaustion of the excitability of the respiratory and vasomotor centres, respiration becomes easy, lividity and swelling of the face disappear, restless anxiety is displaced by growing calm, and the attack is brought to an end.

The views here set forth resemble, in some particulars, the view published by Weber in 1872. They are, nevertheless, the views which I have taught at the London Hospital for the last twenty years, and which were embodied in the opening address of the discussion upon asthma at the Cambridge meeting of the British Medical Association.

It cannot justly be held that the truth or error of a theory is to be determined solely by its fertility or its barrenness; but for us, who are practitioners of medicine, in its capacity for being turned into a working hypothesis, and the extent to which it may be made applicable to practical work, are not only a main ground of its acceptance, but some measure of its worth. Whether the theory of hay fever and of bronchial asthma herein advanced will bear the successful application of this criterion of its value, cannot now be determined. But the question is ripe for discussion, and on another occasion we may submit it to critical examination.

## KOLPOHYSTERECTOMY FOR CANCER,

WITH TABLES COMPARING ITS METHODS AND RESULTS.

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THE recent announcement of but an 8 per cent. mortality in 24 consecutive cases by Fritsch,<sup>1</sup> of but a 9 per cent. mortality in 55 consecutive cases by Martin,<sup>2</sup> and of 16 cases by Staude,<sup>3</sup> without one death, has revived a somewhat abated interest in this operation. Säger's<sup>4</sup> mortality of 28 per cent. obtained in 1883, had to the end of 1884 remained unaltered, notwithstanding the increased numbers of Mundé's,<sup>5</sup> Doche's,<sup>6</sup> and Duncan's<sup>7</sup> lists. The limits of success had been apparently reached, and the operation, even by its friends, abandoned to the opprobrium of an extraordinary death-rate. This opprobrium has been in a degree lifted. A brief history of the operation, the fact of a recently diminished mortality, with an analysis of its concomitants, and among them possibly its cause, will form the objects of this paper.

There is an imperative demand for improved methods of treating cancer. Its increased ravages are reported from a number of sides. In England and Wales from 1860-69 the deaths from cancer showed an annual increase of 248, while from 1870-79 they showed an annual increase of 320. Dr. Farr finds the English death-rate from cancer, 1873-74, 443 to each 1,000,000 inhabitants (*N. Y. Med. Record*, March 14, 1885, from figures of Register-General's Report). In New York, ten years ago, the deaths from cancer were but 400 to the 1,000,000 inhabitants, while, according to the latest returns, they are now 530 to the 1,000,000. Dr. A. R. Carter, of Baltimore, finds a great recent increase in the mortality from cancer in that city. While the population of Baltimore is but five times as great as it was thirty years ago, the deaths from cancer are now at the rate of 450 to the 1,000,000 inhabitants, or twenty-six times as frequent as at that period (*N. Y. Med. Record*, April 25, 1885).

Cancer is comparatively more frequent among women than among men. Simpson, of England, says that cancer is three times as frequent among women as among men.

<sup>1</sup> Bokelmann, *Arch. f. Gyn.*, 1884, p. 75. Heilbrun, *Centralblatt f. Gyn.*, Jan. 31, 1885.<sup>2</sup> Düvelius, *Deutsche med. Wochenschr.*, Feb. 26, 1885.<sup>3</sup> Schutz, *Centralblatt f. Gyn.*, Feb. 7, 1885.<sup>4</sup> Säger, *Arch. f. Gyn.*, 1883, xxi. 99.<sup>5</sup> Mundé, *Tr. Am. Gyn. Assoc.*, 1884.<sup>6</sup> Doche, quoted by *Gaz. Méd. de Paris*, Feb. 14, 1885.<sup>7</sup> Duncan, *London Lancet*, Jan. 31, 1885.

It is rare that reliable statistics regarding the relative frequency of the different varieties of cancer can be obtained, as the variety is seldom designated by physicians in their returns. Especially valuable, therefore, are the figures presented by the K.K. Krankenanstalt Rudolph Stiftungs in Vienna, where, in 1882, there were treated 4451 men and 3159 women. Among this number there were 120 cases of malignant disease, of which 111 were cancers. Of the 120 cases, 25 were men and 95 were women, while of the cases among women, 57 were cancers of the uterus. In 1883 there were treated, in the same place, 5472 men and 3482 women, 115 being cases of malignant disease, and 104 cancers. Of the 115 cases, 27 were among men and 88 among women, 62 being cancers of the womb.

Hofmeier<sup>1</sup> reports that of 16,800 gynecological patients treated in Schröder's clinic, 603 suffered from cancer of the uterus, while of 9400, in Schröder's private practice, 209 had cancer of the uterus.

In rough numbers, therefore, it may be stated that the death-rate from cancer has increased during the last ten years; that three-fourths of all cancers are among women; that one-half of all cancers are cancers of the uterus; and that cancer of the uterus comprises, in Berlin, from one-fourth to one-third of all gynecological complaints.

This increased mortality, with the comparatively greater frequency of the disease among women, and its predilection for the uterine tissues, make extirpation of the uterus for cancer a subject of superior importance at the present time. While, however, some regard the recent successes of this operation as an enthusiastic promise for the future, others distrust their omen, remembering the history of the past.

EARLY EFFORTS AT EXTIRPATION OF THE UTERUS FOR CANCER.—Andreas a Cruce,<sup>2</sup> in 1560, is supposed to have first performed this operation. He left a manuscript description, copies of which are to be found in the Berlin and Göttingen University libraries.

No further literature appears until the early part of the present century, when, in 1810, Joseph's Academy of Vienna offered a prize for an essay upon the subject. This movement was probably incited by the results of partial extirpation in the hands of Osiander, of Germany, and of Lisfranc, of France. The prize was awarded in 1814 to Gutberlet, who gave a complete set of rules for the operation, the abdominal section being made.

In 1825 Langenbeck the father operated according to Gutberlet's directions. The operation was repeated by Conrad Martin, of Germany, by Blundell, of England, and twice by Delpech, of France, who

<sup>1</sup> Zeitschr. f. Geb. u. Gyn., 1884.

<sup>2</sup> Kocks, Arch. f. Gyn., 1879, S. 127. Mikulicz, Berl. klin. Wochenschr., 1880, S. 1282. Kaltenbach, Op. Gyn., 1880, S. 409.

presented the subject before the French Academy. For Langenbeck's operation an assistant stood upon the right side of the patient to hold back the intestines from the excavation, and at the same time to compress the iliacs with the forefinger and thumb. A second assistant held in position a uterine sound, which was useful as a guide to the operator, and to render the neighboring tissues tense. A curved bistoury was carried upon the operator's forefinger so as to shield its cutting edge, and the parametria were divided as they were successively made tense. After all had been severed the uterus was lifted out, and a tampon soaked in a styptic solution was placed in the vagina, and the abdominal wound was closed. No other sutures, ligatures, or drainage were employed.

Delpech first loosened the vagina and separated the bladder from the cervix, the patient being in the position for stone. He afterward opened the abdomen in the linea alba, divided the remaining attachments of the uterus, and removed it. Both of Delpech's cases recovered, a vesico-vaginal fistula being left in the second case. Langenbeck's case died.

In 1822 Sauter removed a cancerous uterus by the vagina; the patient recovered.

Langenbeck's name is also associated with the early history of the vaginal method. By some it is claimed that he originated it, as in 1813 he did a supravaginal amputation for cancer; and upon autopsy, thirty-one years later, the upper segment of the uterus was found to have been completely removed. Langenbeck did a total extirpation, according to Sauter, in 1825, Blundell in 1828, and Récamier in 1829. Langenbeck did this operation without medical assistance. Having a hemorrhage during its progress he was obliged to secure the bleeding vessel with one hand, while with the other hand, and with his lips, he adjusted the ligature. Langenbeck's case died. Récamier's case recovered from the operation, but died two months later of an intercurrent disease.

Of these early operators, Récamier only ligated the lower part of the broad ligament before division. Other operations were done without mass ligatures, and without closing the peritoneal wound. In spite of this absence of precautions the bleeding is reported to have been slight. As a rule, subsequent tying was not required.

Unsuccessful cases, however, followed. West<sup>1</sup> has collected 25 cases, of which 22 died. The *Gaz. des Hôp.* of those years describes scenes, horrible in the extreme, where, without anæsthesia, amid the screams and the writhings of the patient the uterus was literally torn away. Both methods were finally abandoned on account of their unfavorable results. No effort to revive them was made by that generation, and dust gathered upon their records, so that when, in 1878, Wm. A. Freund successfully

<sup>1</sup> West, *Diseases of Women*, 1864, p. 300.



removed the cancerous uterus, he was hailed as a discoverer and as a benefactor.

**FREUND'S OPERATION.**—Previous to the first operation of Freund, Dr. Emil Noeggerath,<sup>1</sup> of New York, made a somewhat similar effort. He loosened the cervix from the vagina, and then opened the abdomen and attempted to crush through the parametria with the *écraseur*, but without success. The uterus was left in the cavity, and a few days later the patient died.

Freund<sup>2</sup> operated mainly according to Gutberlet's directions, his distinguishing peculiarities being the previous ligation of the parametria in three portions before division and the complete closure of the pelvic peritoneal wound.

Freund's first operation was done January 30, 1878. A similar operation was done by Billroth<sup>3</sup> April 2, 1878, and by Kocks<sup>4</sup> April 28, 1878, independently and previous to Freund's publication. The earliest cases, as a rule, recovered, and further successful operations were done by Freund, Olshausen,<sup>5</sup> Martini,<sup>6</sup> Kocks, Spiegelberg,<sup>7</sup> and others.

An atmosphere of enthusiasm still lingers around the accounts of this period. A great future was anticipated for the operation; precedence in its history was eagerly sought; and, to secure to Freund the credit which was thought to be his due, Schröder proposed that it should be designated by his name.

The honor soon proved of doubtful value. Additional cases but added to the mortality list. Shock, hemorrhage, the wounding of neighboring organs, and septicæmia were encountered. The operation was very tedious. Three, four, and five hours were consumed in its performance. The third ligature was spoken of as "*Zeitraubende*." It was peculiarly difficult. Frequently the intestines could not be retained in the cavity, but had to be piled upon the abdomen, and the irritation and actual chill of their from one to three hours' exposure became a factor of importance in the unfortunate result.

The wounding of neighboring parts was not an accident only of the inexperienced. Billroth,<sup>8</sup> Massari,<sup>9</sup> Bardenheuer,<sup>10</sup> Czerny,<sup>11</sup> and Olshausen<sup>12</sup> wounded or included one ureter; Spiegelberg<sup>13</sup> and *Æhlschläger*<sup>14</sup> included both ureters at the same operation; while Reuss,<sup>15</sup> Spiegelberg,<sup>16</sup> and Bardenheuer wounded the bladder. Hemorrhage was always im-

<sup>1</sup> Noeggerath, *Am. Journ. Obst.*, 1877, p. 105.

<sup>3</sup> Billroth; see Mikulicz, *loc. cit.*

<sup>5</sup> Olshausen, *Berl. klin. Wochenschr.*, 1881, p. 497.

<sup>6</sup> Martini; see Freund, *Berl. klin. Wochenschr.*, 1878, p. 418.

<sup>7</sup> Spiegelberg, *Bruntzel, Arch. f. Gyn.*, xiv. p. 245.

<sup>8</sup> Billroth, *Wien. med. Wochenschr.*, 1880, p. 1310.

<sup>10</sup> Bardenheuer, *Centralblatt f. Gyn.*, 1880, p. 140.

<sup>11</sup> Czerny, *Wiener med. Wochenschr.*, 1879, p. 1227.

<sup>12</sup> Olshausen, *Berl. klin. Wochenschr.*, 1881, p. 497.

<sup>14</sup> *Æhlschläger*, *Centralblatt f. Gyn.*, 1879, p. 203.

<sup>15</sup> Reuss, *Arch. f. Gyn.*, xv. p. 139.

<sup>2</sup> Freund, *Volkmann's Sammlung*, N. 133.

<sup>4</sup> Kocks, *loc. cit.*

<sup>9</sup> Massari, *Centralblatt f. Gyn.*, 1879, p. 257.

<sup>13</sup> Spiegelberg, *loc. cit.*, p. 264.

<sup>16</sup> Spiegelberg, *loc. cit.*

minent. Freund himself acknowledged that his third ligature did not make the uterine artery secure. The mortality from septicæmia was great, and the original operation was variously modified.

Kocks<sup>1</sup> separated the uterus from the bladder and rectum before laying the mass ligatures; also, after previous dilatation, he inserted a finger into the bladder to prevent its injury. Kocks reported three cases. Two recovered, one died. Credé<sup>2</sup> widened the field for operation by a partial resection of the anterior pelvic wall. For this purpose the horizontal rami of the pubes were divided so as to leave only a narrow rim of bone just above the clitoris, and about two weeks later the main operation was performed. The abdominal incision was carried to the clitoris by this means. Credé reported but one case, which died in collapse after the main operation. Massari<sup>3</sup> proposed to catheterize both the ureters and the bladder, to prevent wounding and inclusion. He reported but one case, which was unsuccessful. Bardenheuer<sup>4</sup> substituted an open wound with drainage for the closed pelvic peritoneal wound.

It should be especially noted that Bardenheuer, by this method, operated upon ten cases, of which nine recovered, a record which has but recently been surpassed. Breisky and Rydygier<sup>5</sup> incised the vagina and loosened the uterus from the bladder and rectum before making the abdominal incision after the method of Delpsch. Kolaczek<sup>6</sup> omitted the peritoneal suture, and also the ligature *en masse*, as not only ineffectual in preventing hemorrhage, but also as likely to do injury to the nerve plexuses, which it would include. M. B. Freund,<sup>7</sup> a brother to the first operator, proposed previously to elevate the uterus with the colpeurynter, to loosen the cervix from the vagina previous to the abdominal incision, to omit mass ligatures and to divide all tissues with the galvanocautery knife.

In spite of all modifications, however, the mortality of the Freund operation remained excessive. Out of 93 cases collected by Kaltenbach, 53 died from its immediate effects, and, with the end of 1879, it ceased to be commonly performed, although in January of the present year Duncan<sup>8</sup> was able to cite 44 additional cases, the mortality remaining at 72 per cent.

Freund<sup>9</sup> himself, at the International Medical Congress, London, 1880, compared the results of his operation with those of the vaginal

<sup>1</sup> Kocks, loc. cit.

<sup>2</sup> Credé, Arch. f. Gyn., 1879, xiv. p. 430.

<sup>3</sup> Massari, Arch. f. Gyn., xv. p. 441.

<sup>4</sup> Centralblatt f. Chir., 1880, p. 140; Arch. f. Gyn., 1881, xviii. p. 465; Hegar and Kaltenbach's Op. Gyn., p. 408

<sup>5</sup> Rydygier, Berl. klin. Wochenschr., 1880, p. 642.

<sup>6</sup> Kolaczek, Centralblatt f. Chir., 1881, p. 129.

<sup>7</sup> M. B. Freund, Zeitschr. f. Geb. u. Gyn., vi. p. 358.

<sup>8</sup> Duncan, London Lancet, Jan. 31, 1885.

<sup>9</sup> Trans. Internat. Med. Congress, London, 1880, iv. p. 323.

method then coming into prominence, indicating the latter as the operation of the future.

**KOLPOHYSTERECTOMY FOR CANCER.**—As Freund's first operation was antedated by that of Noeggerath, Czerny's operation also had a predecessor in the operation of Coudereau,<sup>1</sup> in 1875, and in the operation of Hennig,<sup>2</sup> who, in 1876, successfully removed the cancerous uterus from the vagina by shelling it out of its peritoneal envelope. July 25 Czerny, also, did a subperitoneal enucleation of the uterus for cancer. The patient recovered.

April 12, 1878, Czerny<sup>3</sup> performed the first operation, which, in its main details, represents the operation of to-day. Czerny published this case as a Sauter-Récamier operation. It was apparently done without reference to Freund's directions, as its difficulty was complained of, and the prospect of greater facility by the abdominal section was anticipated, the author subsequently doing two operations according to Freund. Both of these patients died, and Czerny returned to his original plan, but not until 1880, and after Billroth had operated by the vagina upon a number of cases. While, therefore, precedence in reviving the vaginal method belongs to Czerny, the credit for its introduction should be given to others.

Billroth<sup>4</sup> applied the principles laid down by Freund to the vaginal method, and did his first operation December 14, 1879. During 1880 Billroth operated upon six cases. Schröder<sup>5</sup> operated upon eight cases during the same period. The early and full descriptions furnished by Billroth and Schröder gave the first impulse to the movement.

Since Czerny's first operation, extirpation of the uterus by the vagina for cancer has been practised approximately 341 times, as shown in Table I.<sup>6</sup> of this paper, with a total mortality of 27 per cent.

**METHODS OF OPERATION.**—Czerny<sup>7</sup> drew the uterus firmly downward by hooks which penetrated the cervix or the adjacent tissues. The vagina was then separated from the cervix by a circular incision, the culs-de-sac were opened, and the uterus was everted through one or the other wound; anteverted or retroverted, as the fundus could be the more easily reached. The hooks removed from the cervix were made to engage the fundus in this manœuvre. The peritoneum was secured from retraction by passing through its border a thread of silk. The broad ligaments were then tied in three portions exactly as in Freund's operation,

<sup>1</sup> La Tribune Méd., 1875, p. 364.

<sup>2</sup> Hennig, Allg. Wein. med. Zeitung, n. 39, 1876.

<sup>3</sup> Czerny, Wien. med. Wochenschr., 1879, p. 197.

<sup>4</sup> Wien. med. Wochenschr., 1880, pp. 1281 *et seq.* <sup>5</sup> Schröder, Zeitschr. f. Geb. u. Gyn., 1881, p. 226.

<sup>6</sup> Of the names of operators noticed in the other lists, those of MacCormac, Tansini, Guarnieri, Leisrink, Lane, Shepherd, and Lange are here omitted; MacCormac (Lancet, Jan. 14, 1882), Shepherd (Mich. Med. News, Feb. 10, 1879), and Lange (N. Y. Med. Record, April 1, 1882), because in each of their cases the abdominal section was made; Tansini and Guarnieri (l. c.), because the operations which they reported were done by Bottini; and Leisrink, because the result of his operation was not known. Lane (Pac. Med. and Surg. Journ., April, 1880) is omitted by mistake.

<sup>7</sup> Czerny, Wien. med. Wochenschr., 1879, p. 1197.

the uterus was liberated, and the ligatures were brought out into the vagina. In the majority of Czerny's cases the peritoneum was closed, and the supravaginal wound was united around a drain. In the first cases injections were used, but in the later cases these were replaced by tampons of iodoformized gauze.

Billroth<sup>1</sup> used the circular vaginal incision; employed mass ligatures, which he laid without inverting the uterus; and united the peritoneum around a drain. A second drain was placed in the supravaginal wound, and in some cases permanent irrigation was employed. In his later cases Billroth omitted both sutures and drain, employing the permanent tampon of iodoformized gauze.

Schröder<sup>2</sup> made the circular vaginal incision, drew the uterus down, loosened the cervix from the bladder and rectum, and opened the posterior cul-de-sac first. Then, passing a finger over the broad ligament, and using it as a director, he opened the anterior cul-de-sac. He retroverted the uterus. He tied the broad ligaments *en masse*, using first one ligature and afterward supplementing it by two. He tied one side and divided it before tying the other. He cut the mass ligatures short, and allowed them to escape into the abdominal cavity, or sewed them into the angles of the wound. He made no effort to unite the peritoneal edges, but used drainage, sewing up the supravaginal wound so as simply to embrace the tube.

Olshausen<sup>3</sup> used the circular vaginal incision. He laid a mass ligature upon each side before loosening the cervix. He used silk for his mass ligature, wire supplemented by silk, and subsequently the elastic ligature. He used drainage, both the peritoneal and supravaginal wounds being left open. In his last cases he used tampons of iodoformized gauze.

A. Martin<sup>4</sup> fixed the uterus *in situ*. He first opened Douglas's sac and then laid a mass ligature upon each side, so as to include the peritoneum and the posterior vaginal roof. He divided the attachments of the vagina above this ligature, and guided by his finger in Douglas's sac, he ligated and divided the lateral vaginal wall in the same manner. He retroverted the uterus by means of a sound, bringing it to the floor of Douglas's sac, where it was seized by a hook. He next ligated the remainder of the broad ligament, usually loosening the left side first. Then uniting the anterior peritoneal fold with the anterior vaginal wall, he divided it, and lastly ligated and divided the annexæ of the right side. He washed out Douglas's sac and left a drain in its cavity, closing the vagina with a salicylated tampon. Later the vagina was washed out with a two per cent. carbolic solution three or four times a day. The drainage tube was removed on the sixth or seventh day, and on the tenth day the patient left the bed.

<sup>1</sup> Mikulicz, Wien. med. Wochen., 1880, p. 1281.

<sup>2</sup> Berl. klin. Wochen., Dec. 12, 1881, p. 742.

<sup>3</sup> Olshausen, Berl. klin. Wochenschr., 1881, p. 497.

<sup>4</sup> Martin, Berl. klin. Wochenschr., 1881, p. 261; Diüvelius, Deutsch. med. Wochenschr., Feb. 26, 1885.





1	BECKER, Ann. de Gyn., Sept. 1884.	Oct. 26, 1883.	Vaginal incision ant. and post.; lateral vaginal walls included in mass ligatures.	41 years.	.....	.....	1, highest temp. 38°.	Died May 20, 1884.
1	BODENHOFER, Abstd. Rev. des Sc. Med., 1883, N. 42, p. 624.	.....	.....	.....	.....	.....	1	.....
1	BOLLINO, (Sänger, l. c.)	.....	.....	.....	.....	.....	1	.....
1	BOMPANI, Gaz. Med. di Roma, 1881, viii. 65.	.....	Billroth's method. Duration of operation one hour. Hemorrhage.	34 years, 2 children.	Cervix.	1, shock 12 hours after operation.	.....	.....
3	BOEP (Mundé), Tr. Am. Gyn. Assoc., 1884.	.....	.....	.....	.....	.....	1	.....
5	BORTINI (Tassin), Gaz. Med. Ital. Lombard, April 16, 1881.	March 23, 1881.	Schröder's (?) method. Operation one hour.	36 years.	.....	.....	1, highest temp. 38°.	.....
.....	(Bizzozzero), Abstd. C. f. C., 1882, p. 208.	.....	Schröder's method. Operation less than one hour.	.....	.....	.....	2	.....
1	(Guarnieri), Gaz. degli Osp., Feb. 12, 1882.	1881.	Amputated cervix previous to operation; wounded bladder.	.....	Body.	.....	1	1, end of 6 months.
.....	(Cicci), Gaz. Med. Ital. Lombard., Feb. 28, 1886.	Jan. 9, 1885.	Operation 1½ hours. Profuse hemorrhage.	42 years, 16 children.	Body and cervix.	.....	1, no fever.	.....
1	BRESKY, Prag. med. Wochenschr., 1883, p. 397.	July 7, 1883.	First stuffed cervix, iodoformized gauze; peritoneal suture; drain.	60 years, 4 children.	.....	.....	1	.....
1	BRENDEL, C. f. G., 1883, p. 697.	Aug. 25, 1882.	Circular vaginal incision opened ant. cul-de-sac, then post.; mass ligatures; peritoneal sutures; no drain; iodoform tampon changed third day; wounded bladder.	40 years, 6 children.	Portio vagin- malis.	.....	1, vesico- vag. fistula.	.....
2	BULL, Phil. Med. News, April 5, 1884.	Feb. 1883.	Mass ligatures; peritoneal sutures; no drain; iodoform- ized pent bags in vagina; changed 5th day.	45 years.	do.	.....	1	1, 9th month after oper.; end 13 mos. no hem'rh., no disch'ge.
.....	(Mundé, l. c.)	.....	.....	.....	.....	.....	.....	.....
2	BURKE, N. Y. Med. Rec., 1882, xxii. 644.	.....	.....	.....	Cervix.	.....	1	.....
.....	N. Y. Med. Journ., June 27, 1883, p. 103.	.....	.....	37 years.	do.	.....	1	.....
1	CALDERINI, Abstd. London, Lancet, March 17, 1883.	Jan. 16, 1883.	.....	.....	.....	.....	1	.....
1	CASELLI, Abstd. in C. f. G., 1882, p. 80.	.....	Uterus retroverted; peritoneal wound left open; no drain.	.....	Body and cervix.	1, peritonitis 11 days after operation.	1	.....
1	CUSHING, Am. Journ. Med. Sci., 1882, p. 421.	Sept. 4, 1881.	Vaginal incision ant. and post.; lateral walls included in mass ligatures; uterus retroverted; previous wound left open; no drain; injections every two or three days.	47 years, 1 child.	Portio vagi- malis.	.....	1	.....

TABLE I.—Continued.

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
CZERNY, <i>Wien. med. Wochen.</i> , 1879, 1197; <i>Berl. klin. Wochen.</i> , Nov. 13, 1882.	8	July 25, 1878	Langenbeck's subperitoneal enucleation; wounded peritoneum in three places.	57 years.	.....	....	1		
	...	Aug. 12, 1878.	First modern operation according to the Sauter-Récanier method. Circular vaginal incision; opened ant. or post. cul-de-sac first, whichever reached the fundus most easily; secured the peritoneum from retraction by threads through its border; inverted uterus; used mass ligatures; united the peritoneum; united vaginal wound; drain; no injections; iodoform in last cases. Operation two hours. Bladder wounded. Operation three hours.	33 years, married.	.....	.....	1, vesico-vag. fistula.		
...	...	May 14, 1880.	.....	43 years, 7 children.	.....	1, septic peritonitis 40 hrs. after operation. 1, peritonitis 3d day.			
	...	Sept. 27, 1880.	Hemorrhage.	46 years, 1 child.	.....	.....	1		
	...	Dec. 18, 1880.	.....	44 years, 5 children.	Cervix.	.....			
	...	Jan. 1, 1881.	Operation three hours. Severe hemorrhage.	61 years, 7 children.	Cervix.	1, 3 days after oper.	1		
	...	March 14, 1881.	2 drains, 1 in each angle of wound.	36 years, 10 children.	Portio vaginalis.	.....			
DEMONS, <i>Arch. Gén. de Méd.</i> , 1883; <i>Bull. et Mém. de la Soc. de Chir. de Paris</i> , 1884, x, 577.	...	Oct. 7, 1881.	Operation two hours; hemorrhage; 60 ligatures used.	47 years, 11 children.	Cervix.	.....	1		
	7	Dec. 9, 1882.	Peritoneal wound left open; no drain; tampon iodoformized gauze. Operation $1\frac{1}{4}$ hours.	30 years.	Cervix and body.	.....	1		
	...	Jan. 6, 1883.	.....	34 years.	do.	.....	1	.....	1, end of 18 months.
	...	Feb. 22, 1883.	.....	35 years.	Cervix and lower part of body.	.....	1	1, end 9 mos. after oper.	1, 8 months.
	...	April 14, 1883.	.....	26 years.	do.	1, peritonitis 4 days after operation.			
...	...	June 18, 1883.	Sponge accidentally left in wound.	42 years.	.....	1, peritonitis 3 days after operation.			

...	July 2, 1883.	.....	62 years.	Entire uterus.	1, peritonitis 4 days after operation.	1	.....	1, end 2 years.
DUDON (Dionis), Arch. Gén. de Méd., 1883, vol. ii. p. 257. DUNCAN, Lond. Lancet, Jan. 31, 1885.	Feb. 28, 1884.	.....	41 years.	Cervix and inf. portion body.	.....	1	.....	1, end 2 years.
2	.....	.....	.....	.....	1	1	.....	1, end 2 years.
2	Jan. 22, 1884.	.....	.....	.....	.....	1	.....	1, end 2 years.
.....	Feb. 26, 1885.	.....	.....	.....	1, collapse.	1	.....	1, end 2 years.
4	May 5, 1883.	.....	43 years; married.	.....	.....	1, highest temp. 38.7°.	.....	1, 2 years after oper.
.....	Aug. 28, 1883.	.....	39 years.	Portio vag.; perimetrium free.	.....	1, highest temp. 39° 8th day.	1, end 2 mos. died end 5 months.	End 1 year.
.....	Feb. 19, 1884.	.....	60 years.	Portio vag. and mass in right tube.	.....	1, highest temp. 39° 9th day.	.....	1, 5 mos. after oper.
.....	Sept. 13, 1884.	.....	49 years; married.	Portio vaginalis.	.....	1, highest temp. 38.1° 2d day.	.....	1, 5 mos. after oper.
2	.....	.....	73 years.	Cervix.	1	1	.....	1, 5 mos. after oper.
.....	.....	.....	62 years.	Cervix.	.....	1	.....	1, 5 mos. after oper.
2	.....	.....	.....	.....	1	1	.....	1, 5 mos. after oper.
1	Sept. 19, 1881.	.....	40 years, 9 children.	.....	.....	1	.....	1, 5 mos. after oper.
1	.....	.....	40 years, 8 children.	Cervix and lower part of body.	.....	1	.....	1, 5 mos. after oper.
24	June 27, 1883.	.....	36 years, 2 children, 2 miscarriages.	Portio vag.; cauliflower excrescence size of apple.	.....	1, highest temp. 37.7°.	.....	1, 5 mos. after oper.
.....	.....	.....	.....	.....	.....	1, highest temp. 38.8°.	.....	1, 5 mos. after oper.
.....	June 30, 1883.	.....	39 years, 7 children.	Portio vaginalis, body enlarged.	.....	1, highest temp. 38.8°.	.....	1, 5 mos. after oper.



TABLE I.—Continued.

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
FRITSCH, loc. cit.	..	Oct. 1, 1883.	.....	44 years, 10 children.	Cervix, body enlarged.	1, shock and septicæmia 3d day.			
	..	Oct. 15, 1883.	.....	42 years, 3 children.	Portio vaginalis.	.....	1, highest temp. 39.1°.		
	..	Nov. 9, 1883.	.....	52 years, 12 children.	Cervix much ulcerated.	1, 4th day occlusion of intestine and collapse.			
	..	Nov. 27, 1883.	.....	34 years, 2 children, last 3 months previously.	Portio vag. and post. vag. wall.	.....	1, highest temp. 37.8°.		
	..	Dec. 1883.	.....	40 years, 6 children.	Cervix.	.....	1, highest temp. 38.2°.		
	..	Feb. 1884.	.....	44 years, 3 children.	Portio vaginalis.	.....	1		
	..	Feb. 1, 1884.	.....	41 years, 6 children.	Cervix, uterus enlarged; parametrium infiltrated.	.....	1, fistula of ureter.		
	..	March 6, 1884.	.....	33 years; married.	Portio vaginalis.	.....	1		
	..	April, 1884.	.....	46 years, 7 children.	Cervix.	.....	1, thrombosis saphenous vein.		
	..	May 5, 1884.	.....	39 years, 7 children.	Portio vaginalis.	.....	1		
	..	May 10, 1884.	Tampon removed first 12th day.	77 years, 1 child.	do.	.....	1		
	..	May 12, 1884.	.....	33 years, 3 children.	do.	.....	1		
	..	July 17, 1884.	.....	54 years, 4 children.	do.	.....	1		
	..	Aug. 6, 1884.	.....	37 years, 3 children.	do.	.....	1		
	..	Sept. 1, 1884.	.....	30 years, 4 children.	no ulceration. Portio vag. ulcerated; uterus not enlarged.	.....	1		
	..	Sept. 23, 1884.	.....	44 years, 2 children.	Portio vaginalis.	.....	1		

GARDNER (Hayward) Ans. Med. Gaz., May, 1886.	...	Oct. 7, 1884.	.....	41 years, 4 children.	do.	.....	1
GOODELL, Am. Journ. Obst., April, 1884, p. 392.	1	Dec. 11, 1884.	Mass ligatures; drain; peritoneum closed.	50 years, 8 children.	.....	1	5
GIOMM, Abst. in Phil. Med. News, May 16, 1885.	1	.....	Curette and Paquelin previous to operation; circular vaginal incision; retroverted uterus; mass ligatures; peritoneal wound united; sutures in supravaginal wound; dressing, cotton and iodoform.	.....	.....	1, 4 days after operation.	.....
HAUX, Berl. Klin. Wochen., 1882, p. 361.	5	Feb. 19, 1885.	.....	36 years.	.....	1, 3 days after operation.	1
.....	...	Sept. 15, 1881.	Circular vaginal incision; mass ligatures; peritoneal wound left open; no drain; iodoform tampon, operation 1 1/4 hours.	41 years, 2 children.	Portio vaginalis.	.....	1
.....	...	Sept. 15, 1881.	.....	54 years, several child.	Portio vag.; left paramet. infiltrated.	1, of consecutive bronchitis	1
.....	...	Jan. 24, 1882.	.....	25 years, 3 children.	Portio vaginalis.	.....	1
.....	...	Feb. 21, 1882.	.....	28 years; married.	Cervix.	.....	1
.....	...	May 5, 1882.	.....	37 years, 4 children.	Portio vaginalis.	.....	1
HELFRICH, Abst. in Schmidt's Jahrbuch, N. 194, p. 152.	1	.....	Bladder wounded; intestines prolapsed.	58 years.	.....	.....	1
HERFF, Arch. f. Gyn., 1885, p. 315.	1	.....	Fritsch's method, modified by wider lateral vaginal incision.	49 years, 2 children.	.....	.....	1, highest temp. 38.1° 5th day.
HOLMER (Howitz, L. c.)	1	.....	.....	.....	.....	.....	1
HOWITZ, Abst. C. f. G., 1883, 438.	2	Sept. 20, 1882.	Vagina incised, ant. and post.; mass lig.; periton. closed; drain; iodoform; wounded bladder; operation 4 1/2 hours.	57 years, 13 children.	Portio vaginalis.	.....	1
.....	...	Oct. 12, 1882.	.....	41 years, 12 children.	Portio vag. rt. paramet.	.....	1
JOHANNOVSKY, Prag. med. Wochen., Nov. 14, 1883, p. 449.	1	Aug. 18, 1883.	Vagina incised, ant. and post.; uterus retroverted; mass ligatures; peritoneal wound left open; drain; iodoform.	51 years, 8 children.	Cervix and body.	.....	1
KOCHER, Abst. C. f. C., 1882, p. 164.	1	.....	No sutures; no tube; antiseptic tampon and injections.	.....	.....	.....	1, and 3 w'ks after oper.
KRAUSSOLD, C. f. C., 1883, x. p. 17.	2	.....	Uterus anteverted; mass ligatures; peritoneal wound left open; drain; vaginal tampon of iodoformized gauze.	41 years; was a 2d wife; 1st wife also had uterine cancer.	.....	.....	1
.....	...	April 12, 1882.	.....	39 yrs., 3 child. many abort'ns; husb. syphil.	Portio vaginalis.	.....	1

TABLE I.—Continued.

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
KUFFERATH, Ann. de Gyn., July, 1884, p. 46.	1	Sept. 22, 1883.	.....	45 years, 2 children.	Cervix.	.....	1	1, 5 hours after oper.	
LEBEDEV, Index Medicus, Aug. 1885.	2	.....	.....	.....	.....	.....	2		
MARTIN, A., Arch. f. Gyn., 1882, xx, 291; Path. u. Ther. der Frauenkheiten, 1885, p. 303.	52	Before 1882.	Curettes diseased surface previous to operation; cervix is strongly pulled toward the pubes to prevent prolapse of intestines; posterior cul-de-sac is opened first; uterus is not inverted; bottom of cul-de-sac is united to vagina before further division; ant. cul-de-sac is opened last; mass ligatures for broad ligaments; peritoneum not united; drain; tampon.	.....	.....	8	23		
.....	..	1882-84.	.....	.....	.....	4	17		
MANDILLON (Danton), Arch. Gén. de Méd., 1883, ft. p. 267.	..	.....	Peritoneal sutures and drain.	.....	.....	.....	1		
MÜLLER, P., Wiener med. Wochen., Feb. 23, 1884, p. 214.	4	.....	Vagina incised ant. and post.; lateral walls left intact until uterus retroverted; provisional mass ligatures each side over brd. lig.; uterus divided vertically before removal; no peritoneal sutures; no drain; sublimated injections two or three times daily; carbolic tampon. United peritoneum by stitches, including supravaginal wound; drain.	.....	.....	.....	4		
MUNDÉ, Trans. Am. Gyn. Assoc., 1884; N. Y. Med. Journ., July 25, 1885.	3	Oct. 10, 1883.	.....	.....	.....	.....	1, drain removed 7th day.	1, end of 1 year.	
.....	..	Nov. 9, 1883.	Schröder's method; hemorrhage from post. vaginal wall concealed by speculum.	.....	.....	1, 4 hours after oper'n shock and hemorrhage.			
NORRGERATH, (Mundé, l. c.)	3	.....	.....	.....	.....	3	10		
NOVARO (Capotes), Abst. C. f. G., April, 1885.	20	.....	.....	.....	.....	10			
ORSHAUSEN, Ber. klin. Wochen., 1881, p. 497; Arch. f. Gyn., 1882, p. 291; Beiträge zur Gyn., 1884, p. 107.	32	April 2, 1881.	Circular vaginal incision; mass ligatures, silk, wire, or elastic; no peritoneal sutures, but always drainage tube into peritoneal cavity. Operation two hours.	61 years; married; nullip.	Body.	.....	1		
.....	..	April 11, 1881.	.....	45 years, 5 children.	Portio vaginalis.	.....	1		
.....	..	May 28, 1881.	Collapse during operation; rallied with difficulty.	48 years, 1 child.	Cervix.	.....	1		

1 Düvelius's statement of 55 cases, with 5 deaths, is here omitted because the point from which it overlaps the older reports is not apparent.

...	June 13, 1881.	Hemorrhage during operation.	36 years, 10 children.	do.	.....	1	1
...	June 27, 1881.	Prolapse of intestines; collapse during operation.	39 years, 1 child.	Portio vaginalis.	.....	1	1
...	July 20, 1881.	Collapse during operation.	34 years; married.	do.	.....	1	1
...	.....	.....	.....	.....	6	11	1, died 15 months after operation.
...	.....	.....	.....	.....	1	8	1, died 17 months after oper. 1.
1	Sept. 18, 1882.	Billroth's method.	45 years.	Portio vaginalis.	1, 32 hours after oper.	1	1
1	March 8, 1884.	.....	34 years.	Cervix.	.....	1	1
1	April 1, 1880.	Uterus retroverted; mass ligatures; open peritoneal wound; drain; cancerous mass not all removed.	35 years, 8 children.	Cervix, cys. brd. ligam. t. infiltrated.	.....	1	1, 5 mos. after oper.; died 9 months after operation.
1	Sept. 23, 1884.	No peritoneal sutures; drain.	.....	.....	.....	1, highest temp. 101.4°	1
2	.....	.....	.....	.....	1	1	1
2	Oct. 18, 1881.	Circular vaginal incision; uterus retroverted; mass ligatures; peritoneum closed; iodiform; no drain; hemorrhage during operation.	56 years, 5 children.	Cervix.	.....	1	1, died 10 mos. after operation.
...	.....	.....	36 years.	do.	.....	1	1
10	Feb. 26, 1881.	First opened Douglas's sac and then united the bottom of cul-de-sac to vagina by a peculiar "kettennaht;" retroverted uterus; tied and divided bd. lig. in short sections; divided peritoneum ant. cul-de-sac last; left peritoneal cavity open. Patient occupied half sitting posture in kind of chair. No drain; no injections.	55 years, 6 children.	Body.	.....	1	1, end of 1½ years.
...	March 11, 1881.	.....	24 years, 3 children.	.....	.....	1	1, died 31 weeks after operation.
...	Aug. 24, 1881.	.....	48 years, 2 children.	.....	.....	1	1
...	Sept. 21, 1882.	.....	55 years, 7 children.	Cervix.	.....	1	1
...	Sept. 26, 1882.	.....	44 years, mid., nullip.	Body (much enlarged).	.....	1	1
...	Sept. 30, 1882.	.....	34 years, 1 child.	Body and cervix.	.....	1	1, 6 months after oper.
...	Dec. 29, 1882.	.....	53 years, 8 children.	Body.	1, peritonitis 4th day.	1	1
...	.....	Included ureters.	52 years, 2 children.	Cervix.	1, 7th day.	1	1

PAGER, Lo Sperimen-  
tale, 1882, ii. 487.  
PERUZZI, Gaz. degli  
Osp., May 7, 1884  
PAWLIK, Wien. klin.,  
1882, p. 403.

PURCELL, London  
Lancet, Jan. 31, 1885.  
SANGER, (Sänger,  
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SANGER (Leipzig),  
Arch. f. Gyn., 1883,  
xxi. 99.

SCHATZ, Arch. f. Gyn.,  
1883, xxi. III. 409.



TABLE I.—Continued.

Operator, and where reported.	No. of cases.	Date of operation	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
SCHLÄTZ, loc. cit.	...	.....	.....	52 years, 2 children.	Body.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	.....	.....	42 years, 4 children.	Portio vagi- nalis.	1, 3 hours after oper. 1, lived 4 dys 1, 2d day.	.....	.....	
SCHLÄTZ, loc. cit.	2	.....	Billroth's method.	.....	Cervix.	.....	1	.....	
SCHLÄTZ, loc. cit.	34	May 17, 1880.	Retroverted uterus; mass ligatures; no peritoneal sutures, but vaginal wound united around drain.	.....	do.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	May 19, 1880.	.....	.....	do.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	May 20, 1880.	.....	.....	do.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	July 1, 1880.	.....	.....	do.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	July 26, 1880.	.....	.....	do.	.....	1	.....	
SCHLÄTZ, loc. cit.	...	July 30, 1880.	.....	.....	do.	1, 3 hours after oper.	1	.....	
SCHLÄTZ, loc. cit.	...	Dec. 6, 1880.	.....	.....	.....	.....	1	.....	
SCHLÄTZ, loc. cit.	...	Aug. 29, 1880.	.....	.....	.....	.....	1	.....	
SCHLÄTZ, loc. cit.	...	.....	.....	.....	.....	6	14	.....	2, end of 2 years; 2, end 1 year.
SIMPSON, Edinb. Med. Journ., 1862-3, p. 425.	1	May 23, 1882.	Used cautery knife; divided uterus vertically, according to method of Müller; secondary hemorrhage. Does not consider the cautery safe as ligatures and knife.	39 years, 6 children.	.....	2 1, collapse.	4	.....	
SOLOVIEFF, Abstd. Rev. des Sc. Méd., 1883, N. 42, p. 624.	1	.....	Billroth's method.	53 years.	.....	.....	1	.....	
SOLOVIEFF, Abstd. in C. f. G., 1882, p. 607.	1	.....	Schröder's method.	33 years.	Cervix.	.....	1	.....	
STARCK, Berl. klin. Wochen., March 20, 1882.	1	Aug. 2, 1881.	No mass ligatures; no sutures; no drain; vagina filled with Lister's gauze; ureter was implicated; the diseased part was excised; central extremity tied, and one week later extirpation of the kidney was performed.	42 years, 7 children.	Portio vagi- parametrium invaded.	.....	1	.....	
STARCK, Berl. klin. Wochen., March 20, 1882.	1	Aug. 2, 1881.	Thorough disinfection; circular vaginal incision; uterus retroverted; mass ligatures; ant. cul-de-sac divided last; stumps sunken; peritoneum united, and supravaginal wound sewed up around drain; iodoform.	.....	Cervix and body.	.....	1	1, end 1 yr.	
STAUBE, Deutsch. med. Wochen., 1883, p. 659; (Schütz) C.f. G., Feb. 7, 1885.	16	June, 1882.	.....	.....	.....	.....	1	.....	
STAUBE, Deutsch. med. Wochen., 1883, p. 659; (Schütz) C.f. G., Feb. 7, 1885.	...	.....	.....	33 years.	Cervix.	.....	1	.....	



TABLE I.—*Concluded.*

Operator, and where reported.	No. of cases.	Date of operation.	Method of operation.	Patient's age and number of births.	Variety of growth.	Died.	Survived.	Disease returned.	No. reported well after operation.
THIERSCH (Sünger, i. c.) TULLAUX.	4	.....	.....	.....	.....	1	3	.....	.....
TRÉLAT, <i>Gaz. des Hôp.</i> , July 23, 1885.	1	.....	Vag. incised, ant. and post.; peritoneum left open; drain; single vaginal suture; iodoformized tampon.	.....	.....	.....	1	.....	.....
VECHU, <i>De San Francisco</i> , Lançet, May, 1883, Abstr. in <i>G. F. G.</i> , 1883, p. 695.	1	July 2, 1884.	.....	.....	.....	.....	1	.....	1, end of 1 year.
VERE, <i>J. Deutsch. med. Wochen.</i> , Jan. 3, 1883.	1	.....	Mass ligatures; uterus liberated by galvanocautery wire; salicylated tampon.	53 years.	.....	.....	1	.....	.....
.....	2	.....	.....	65 years, 7 children.	Body.	.....	1	.....	.....
.....	.....	.....	Schröder's method.	78 years, virgin.	Body.	.....	1	.....	.....
WALLACE, <i>Br. Med. Journ.</i> , Dec. 1884.	3	Jan. 31, 1884.	Previously cut away diseased tissue with bistoury; retroverted uterus; used elastic mass ligature secured from sliding by barelip pin; closed supravaginal wound; no drain; patient left in half sitting position.	.....	.....	.....	1, highest temp. 100.5°	.....	.....
.....	.....	April 28, 1884.	.....	47 years, 8 children.	Cervix and vag.; nodule rt. brd. lig.	.....	1	.....	.....
.....	.....	May 21, 1884.	Operation difficult.	56 years.	Cervix; cavity in uterus 3 1/4 in.	1, collapse 24 hours after oper.	1	.....	.....
WEIR, <i>Phil. Med. News</i> , June 17, 1885.	1	Nov. 10, 1884.	Anteverted uterus; mass ligatures; opened post. cul-de-sac last; united peritoneum; iodoformized peat bags in vagina; no drain.	40 years.	.....	.....	.....	.....	.....
.....	1	.....	.....	.....	.....	1, 4th day.	.....	1, and 10 months.	.....
WILE, <i>N. Eng. Med. Mo.</i> , 1882-3, ii. 207.	2	.....	.....	34 years,	.....	1, peritonitis	.....	.....	.....
WILLIERS (Mason), <i>St. Barth. Hosp. Rep.</i> , 1883, xix. p. 111.	3	June, 1882.	Vag. incised ant. and post.; uterus retroverted and divided vertically; no mass ligatures; no sutures; no drain; iodoformized tampon.	37 years, 35 years, 12 children.	Cervix.	1, peritonitis 3d day.	1	.....	.....
ZWINGER, <i>C. f. G.</i> , June 26, 1884.	.....	.....	.....	.....	Cervix; Cervix; body enlarged; fundus half way to umbilicus.	.....	1, highest temp. 38.2° 3d day.	.....	1
.....	.....	.....	Bowels first evacuated twelfth day.	.....	Cervix.	.....	1	.....	.....
Total,	341	.....	.....	.....	.....	93	248	.....	.....

Martin's method is distinguished by the fact that he operates *in situ*, that he ligates the vaginal wall before incision, and that he covers the supravaginal wound. For his latest cases Martin has used the tampon of iodoformized gauze.

Schatz<sup>1</sup> also first opened Douglas's sac and united the vaginal wall to the bottom of the cul-de-sac by a chain of stitches before division. Schatz's method is further distinguished by the fact that he opened Douglas's sac to its deepest portion, that he left the peritoneal cavity freely open, and that he used no tube. During convalescence the patient was made to maintain a semi-erect position by reclining in a kind of chair.

Von Teuffel,<sup>2</sup> on the contrary, opened Douglas's sac as high as possible. He used mass ligatures which included the lateral vaginal wall. He used peritoneal sutures, completely closing the cavity and leaving the stumps out. He used neither tampon nor drain.

Baum<sup>3</sup> left the peritoneal wound open and used a tube. He did not use prophylactic injections, but only when the temperature commenced to rise. He removed the drainage tube on the fifth or sixth day.

Müller<sup>4</sup> cut anteriorly and posteriorly, leaving the lateral walls of the vagina intact until the uterus had been turned out. The uterus was inverted through the posterior wound. He then passed a thick provisional ligature around each broad ligament, including the lateral vaginal wall, and divided the uterus vertically into halves before removing it. He ligated the vessels separately, both in the stumps and in the vaginal wall. He sank the stumps, using no sutures, and closing the vagina with a carbolized tampon. This division of the uterus before removal had been previously suggested by Corradi.<sup>5</sup>

Fritsch<sup>6</sup> divides the lateral vaginal wall first, penetrating as deeply as possible and ligating vessels as they are encountered. He next opens the anterior cul-de-sac, and unites the peritoneal border with the anterior vaginal wall by three or four sutures. He then anteverts the uterus and ties the broad ligaments in small sections, dividing them as tied, six or seven ligatures being employed upon each side. He opens the posterior cul-de-sac last, finally uniting the peritoneum with the vagina as before. He leaves the peritoneal cavity fully open, and uses no drain, but dusts the wounded surfaces with iodoform, and packs the vagina with iodoformized gauze, which has been undisturbed from seven to ten days.

Hahn<sup>7</sup> tied and divided the broad ligaments in small sections, cut his ligatures short, left the wound fully open, and used no drain. He blew

<sup>1</sup> Schatz, Arch. f. Gyn., 1883, xxi. p. 409.

<sup>2</sup> Haidlen, Arch. f. Gyn., xix. p. 106.

<sup>3</sup> Baum, Arch. f. Gyn., xiv. p. 481.

<sup>4</sup> Müller, Wien. med. Wochenschr., Feb. 23, 1884.

<sup>5</sup> Trans. Internat. Med. Congress, London, 1880, iv. p. 325.

<sup>6</sup> Fritsch, Die Krankheiten der Frauen, 1884, p. 314; Bokelmann, Arch. f. Gyn., 1884, p. 75.

<sup>7</sup> Hahn, Berl. klin. Wochenschr., 1882, p. 361.



a drachm of iodoform into the wound and filled the vagina with iodoformized gauze.

Sänger,<sup>1</sup> while advocating a complete peritoneal seam, in his own cases, left the wound open, and used no drainage. Sängér employed iodoform, but considered the quantity used by Schatz dangerous. He blew in about a gramme and used iodoformized tampon.

Staudef<sup>2</sup> makes a circular vaginal incision, retroverts the uterus, uses mass ligatures, and divides the anterior cul-de-sac after the other uterine attachments have been divided. He completely closes the peritoneum and unites the vagina around a drain.

Taufer<sup>3</sup> also retroverted the uterus. He closed the peritoneum and united the supravaginal wound around a drain.

Demons<sup>4</sup> leaves the peritoneum open and uses no drain, but a tampon of iodoformized gauze.

Terrier<sup>5</sup> uses mass ligatures tied like the ligature of the ovariectomy pedicle, leaves the peritoneal wound open, and draws the supravaginal wound together by a single suture about a drain.

Bottini<sup>6</sup> first called attention to the value of previous amputation of the diseased cervix. Otherwise he proceeds, in the main, according to Schröder's method.

Simpson<sup>7</sup> divided the uterus vertically and used the cautery in its removal. He had secondary hemorrhage, and remarked that another time he would preferably rely upon ligatures and the knife.

Wallace<sup>8</sup> previously cuts away the diseased tissue with a bistoury, retroverts the uterus, and uses elastic mass ligatures, preventing them from sliding by the harelip pin. He does not try to unite the peritoneal edges, but closes the supravaginal wound, using no drain. The patient is kept in a half-sitting position, after the operation, according to Schatz's directions.

Fenger<sup>9</sup> anteverted the uterus, used mass ligatures, and united the peritoneum, using a drain and permanent irrigation in the supravaginal wound.

Mundé,<sup>10</sup> in the main, follows the method of Schröder.

Bernays<sup>11</sup> first lays two mass ligatures, including the vaginal walls and the parametria so far as they can be reached. He then divides the vagina within these ligatures by a circular incision, opens the anterior cul-de-sac, anteverts the uterus, ties the upper part of the broad ligament, and divides it, and later the lower part. He brings the ligatures into the

<sup>1</sup> Sängér, *Arch. f. Gyn.*, 1883, xxi. p. 99.

<sup>3</sup> Taufer, *Arch. f. Gyn.*, 1884, xxiii. p. 367.

<sup>5</sup> Terrier, *Gaz. des Hôpitaux*, 1885, p. 606.

<sup>6</sup> Tansini, *Gaz. Med. Ital., Lombard*, April 17, 1881; Bizzozzero, *Cent. f. Chir.*, 1882, p. 208.

<sup>7</sup> Simpson, *Edin. Med. Journ.*, 1882-83, p. 425.

<sup>8</sup> Wallace, *Brit. Med. Journ.*, Dec. 1884.

<sup>9</sup> Fenger, *Am. Journ. Med. Sci.*, 1882, p. 17.

<sup>2</sup> Staudef, *Deutsch. med. Wochenschr.*, 1883, p. 659.

<sup>4</sup> Demons, *Arch. Gén. de Méd.*, 1883, vol. ii. p. 257.

<sup>10</sup> Mundé, *Trans. Am. Gyn. Assoc.*, 1884.

<sup>11</sup> Bernays, *St. Louis Med. and Surg. Journ.*, p. 369, 1884.

vagina, and uses no sutures, tampon, nor drain. Injections of pure water are made four times in the twenty-four hours. No disinfectant is used either during the operation or during the subsequent treatment.

**THE TOTAL AVERAGE MORTALITY.**—Statistics in regard to the mortality of kolpohysterectomy have been at different times collected.<sup>1</sup> According to these figures, the mortality from the operation would appear to have increased during the first years of its performance. Careful examination of the records now at our command does not, however, sustain this view. Many of the operations done during the first years were not reported until later, and, hence, their failures lowered the percentage of a more successful date.

The proof of this assertion is found in Table II. of this paper, where the 341 cases are tabulated according to the date of the operation where it could be found, this list being added to a supplementary list made up of operations whose date is not given, and which were classified according to the date of the report. While the results of this computation are also open to criticism, it is evident that they must approach more nearly to accuracy than do those of lists made out entirely from the date of the report.

The total mortality at the end of 1880 was 37 per cent.						
"	"	"	"	1881	"	31
"	"	"	"	1882	"	29
"	"	"	"	1883	"	29
"	"	"	"	1885 <sup>2</sup>	"	27

**THE MORTALITY FOR SEPARATE YEARS.**—The record for separate years shows the same steady improvement. As shown by Table II.:

Cases done previous to the end of 1880, had a mortality of 37 per cent.						
"	"	or reported during	1881,	"	"	27
"	"	"	1882,	"	"	27
"	"	"	1883,	"	"	28
"	"	"	1885,	"	"	24

The increased mortality shown by the list for 1883 is manifestly due to the great number of scattered cases of remote date, which were during that period reported. The mortality of the cases in which the operation was actually done during 1883 was but 22 per cent.

<sup>1</sup> Kaltenbach, *Op. Gyn.*, 409, 1880, collected a total of 29 cases, with a mortality of 27 per cent.; Olshausen, *Berl. klin. Wochenschr.*, 1881, No. 35, 41 cases, with a mortality of 29 per cent.; Haidlen, *Arch. f. Gyn.*, xix. p. 106, 52 cases, with a mortality of 37 per cent.; Czerny, *Berl. klin. Wochenschr.*, 1882, Nos. 46 and 47, 81 cases, with a mortality of 32 per cent.; Sönger, *Arch. f. Gyn.*, 1883, h. 1, p. 99, 133 cases, with a mortality of 28 per cent.; Mundé, *Trans. Am. Gyn. Assoc.*, 1884, 254 cases, with a mortality of 28 per cent.; Duncan, *Brit. Med. Journal*, Jan. 31, 1885, 276 cases, with a mortality of 28 per cent.; Doche, *l. c.*, also a list, with a mortality of 28 per cent.

<sup>2</sup> The results of 1884 and 1885 are tabulated together, because a fairer percentage can thus be obtained, the report for 1885 being yet necessarily imperfect.

TABLE II.

## OPERATIONS PERFORMED OR REPORTED DURING THE YEARS 1884-85.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Bernays . . . . .	2	0	2	Bopp . . . . .	3	2	1
Bottini . . . . .	1	0	1	Bull . . . . .	1	1	0
Demons . . . . .	1	0	1	Duncan . . . . .	1	0	1
Düvelius . . . . .	2	0	2	Engström . . . . .	2	1	1
Fritsch . . . . .	17	0	17	Foreman . . . . .	1	0	1
Gardner . . . . .	1	1	0	Goodell . . . . .	1	1	0
Giommii . . . . .	1	1	0	Herff . . . . .	1	0	1
Mundé . . . . .	1	1	0	Lebedev . . . . .	2	0	2
Peruzzi . . . . .	1	0	1	Martin . . . . .	21	4	17
Purcell . . . . .	1	0	1	Müller . . . . .	4	0	4
Trélat . . . . .	1	0	1	Noeggerath . . . . .	3	3	0
Wallace . . . . .	3	1	2	Novaro . . . . .	20	10	10
Weir . . . . .	1	0	1	Olshausen . . . . .	9	1	8
Zweifel . . . . .	2	0	2	Schröder . . . . .	6	2	4
				Staude . . . . .	10	0	10
				Terrier . . . . .	2	1	1
				Tillaux . . . . .	1	0	1
Total . . . . .	35	4	31	Total . . . . .	88	26	62
Mortality . . . . .			11 per cent.	Mortality . . . . .		29 per cent.	
Total operations performed and reported during the years 1884-85					123	30	93
Mortality . . . . .						24 per cent.	

## OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1883.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Bernays . . . . .	1	0	1	Ahlfeld . . . . .	2	1	1
Boeckel . . . . .	1	0	1	Bogoluboff . . . . .	1	0	1
Breisky . . . . .	1	0	1	Bolling . . . . .	1	1	0
Bull . . . . .	1	0	1	Burke . . . . .	1	0	1
Calderini . . . . .	1	0	1	Dudon . . . . .	2	1	1
Demons . . . . .	5	3	2	Duncan . . . . .	1	1	0
Düvelius . . . . .	2	0	2	Holmer . . . . .	1	0	1
Fritsch . . . . .	7	2	5	Mandillon . . . . .	1	0	1
Johannovsky . . . . .	1	0	1	Sänger (G.) . . . . .	2	1	1
Kufferath . . . . .	1	0	1	Sänger (L.) . . . . .	1	0	1
Mundé . . . . .	2	1	1	Schatz . . . . .	3	2	1
Tauffer . . . . .	4	0	4	Schröder . . . . .	20	6	14
				Solovieff . . . . .	1	0	1
				Solowiew . . . . .	1	0	1
				Staude . . . . .	3	0	3
				Stewart . . . . .	1	0	1
				Studsgaard . . . . .	1	0	1
				(Howitz) . . . . .	2	2	0
				Thiersch . . . . .	4	1	3
				Vecchi, de . . . . .	1	0	1
				Veit, J. . . . .	2	0	2
				Willets . . . . .	2	1	1
Total . . . . .	27	6	21	Total . . . . .	54	17	37
Mortality . . . . .			22 per cent.	Mortality . . . . .		31 per cent.	
Total operations performed and reported during the year 1883					81	23	58
Mortality . . . . .						28 per cent.	

## OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1882.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Brendel . . . . .	1	0	1	Anderson . . . . .	1	0	1
Hahn . . . . .	3	0	3	Bottini . . . . .	2	0	2
Howitz . . . . .	2	0	2	Burke . . . . .	1	0	1
Kraussold . . . . .	2	0	2	Demons . . . . .	1	0	1
Paggi . . . . .	1	1	0	Esmarch . . . . .	2	1	1
Schatz . . . . .	4	1	3	Helferich . . . . .	1	0	1
Simpson . . . . .	1	1	0	Martin . . . . .	31	8	23
Staude . . . . .	1	0	1	Olshausen . . . . .	17	6	11
Zweifel . . . . .	1	1	0	Wile . . . . .	1	1	0
Total . . . . .	16	4	12	Total . . . . .	57	16	41
Mortality . . . . .			25 per cent.	Mortality . . . . .		28 per cent.	
Total operations performed and reported during the year 1882					73	20	53
Mortality . . . . .						27 per cent.	

OPERATIONS PERFORMED OR REPORTED DURING THE YEAR 1881.

Performed.	No.	Died.	Rec.	Reported without date.	No.	Died.	Rec.
Bottini . . . . .	2	0	2	Bardenheuer . . . . .	1	1	0
Cushing . . . . .	1	0	1	Bompiani . . . . .	1	1	0
Czerny . . . . .	3	1	2	Billroth . . . . .	6	1	5
Fenger . . . . .	1	0	1	Caselli . . . . .	1	1	0
Hahn . . . . .	2	1	1	Kocher . . . . .	1	0	1
Olshausen . . . . .	6	0	6				
Sänger . . . . .	1	0	1				
Schatz . . . . .	3	0	3				
Starck . . . . .	1	0	1				
Staude . . . . .	1	0	1				
Tauffer . . . . .	1	1	0				
Teuffel . . . . .	2	2	0				
Total . . . . .	24	5	19	Total . . . . .	10	4	6
Mortality . . . . .	20	per cent.		Mortality . . . . .	40	per cent.	
Total operations performed or reported during 1881 . . . . .					34	9	25
					27	per cent.	

OPERATIONS PERFORMED BEFORE AND DURING 1880.

Performed.	No.	Died.	Rec.
Baum . . . . .	4	2	2
Billroth . . . . .	6	3	3
Czerny . . . . .	5	2	3
Pawlik . . . . .	1	0	1
Schede . . . . .	2	2	0
Schröder . . . . .	8	1	7
Staude . . . . .	1	0	1
Teuffel, v. . . . .	3	1	2
Total . . . . .	30	11	19
Mortality . . . . .	37	per cent.	
Total operations performed before and during the year 1880 . . . . .		No.	Died.
		30	11
Mortality . . . . .		37	per cent.
Total operations performed and reported during the years 1881, 1880 . . . . .		64	20
Mortality . . . . .		31	per cent.
Total operations performed and reported during the years 1882, 1881, 1880 . . . . .		137	40
Mortality . . . . .		29	per cent.
Total operations performed and reported during the years 1883, '82, '81, '80 . . . . .		218	63
Mortality . . . . .		29	per cent.
Total operations performed and reported during 1884-5, '83, '82, '81, '80 . . . . .		341	93
Mortality . . . . .		27	per cent.

The report of the single operator, as shown by Table II., is also of interest. Previous to 1881 Billroth lost 3 out of 6 cases; subsequently Billroth lost but 1 out of 6 cases. Schröder, on the contrary, previous to 1881 lost but 1 out of 8 cases, while subsequently he has lost 6 out of 20, and 2 out of 6. In 1882 Martin reported himself as having lost 8 out of 31 cases, while in 1885 Düvelius reports him as having lost but 5 out of 55. In 1881 Olshausen operated 6 times successfully; in 1882 he reported 6 deaths out of 17 additional cases; and in 1884 10 additional, of which he lost but 1. In 1883 Fritsch lost 2 out of 7 cases. In 1884 and 1885 he reported 17 additional cases, without a death. Staude, a recent operator, has done 16 operations, without a death.

MORTALITY ACCORDING TO THE TREATMENT OF THE WOUND.—The history of this operation is but a short one, yet two distinct periods of advancement in its results may be distinctly traced. The first occupies 1881 and 1882, during which the total mortality fell from 37 per cent. to 29 per cent. The second occupies the years of 1884 and 1885, during which the total mortality has fallen from 29 per cent. to 27 per cent.



The first of these periods corresponds with the introduction of iodoform in the treatment of wounds. The second has coincided with the adoption of certain precautions in the course of the operation itself, and certain further peculiarities in the subsequent treatment.

In all recent operations the diseased cervix has been either amputated, curetted, or cauterized previous to the first incision.

The different methods of subsequent procedure vary, first, in the vaginal incision, which has been circular according to the most common practice, but which has also been confined to the anterior and posterior walls, the lateral walls being retained to be included in the mass ligatures, as done by Müller and Bernays, or confined to the lateral walls for the division and securing of the uterine artery, previous to the anterior and posterior division, as practised by Fritsch. The different methods vary, secondly, in the position of the uterus, which may be fixed *in situ*, as done by Martin; simply pulled down, as done by Billroth; retroverted and the fundus made to present at the vulva, as done by Schröder; or anteverted and brought out through the anterior cul-de-sac, as done by Czerny in a number of cases. Thirdly, they may differ in the order of the opening of the cul-de-sacs, whether both be opened previous to the eversion of the uterus, as is the commonest practice, or whether the anterior cul-de-sac only be opened where the uterus is turned out by anteversion, or the posterior cul-de sac only be opened where the uterus is turned out by retroversion, until the broad ligaments have been tied and divided, and the uterus prepared for complete removal. This precaution prevents any secretion of the uterus from penetrating the cavity of the peritoneum during inversion. They differ, fourthly, in the use of the mass ligature, whether one, two, three, or many; whether the whole ligament be secured and divided at once, as was done in the earlier operations; whether it be tied in small sections and divided step by step, as done by Fritsch; or whether, on the other hand, vessels be tied separately as encountered, with or without a provisional mass ligature. They differ, fifthly, in the treatment of the mass ligatures, whether they be cut short and sunken, or whether they be kept long and brought out into the vagina to assist in drainage. Sixthly, they differ in the treatment of the peritoneal wound, whether it be completely closed, as done by v. Teuffel; be united around a drain, according to the early practice of Billroth; be left completely open with a drain, as practised by Martin, Baum, Olshausen, and by Billroth in some later cases; or whether it be left completely open without a drain, as practised by Fritsch, Demons, Müller, Billroth, Schatz, Bernays, and others. They differ, seventhly, in the treatment of the supravaginal wound, whether it be closed around a drain, as done by Schröder; closed without a drain, as done by Goodell and Wallace; left completely open, with or without a drain; or whether it be covered by peritoneum,

the peritoneum of the cul-de-sac being united to the mucous membrane of the vagina, as practised by Martin, Schatz, Fritsch, and Von Herff. They differ, eighthly, in the use or omission of injections, or the tampon of iodoformized gauze.

If we except the previous treatment of the diseased part by amputation, the curette, or the caustic, and the protection of the peritoneal cavity during inversion of the uterus, the contested points here enumerated concern only questions of facility in operation until we arrive at the treatment of the wound, which supremely concerns the immediate mortality of the result.

In Table III. of this paper is a statement of the mortality list, classified according to the treatment of the wound, where this has been detailed. This Table utilizes 280 cases having a total mortality of 23 per cent. As the total average mortality of the whole number of cases is 27 per cent., it is apparent that Table III. cannot give an exaggerated impression of the mortality list; that if all cases had been detailed, the true mortality list for any method would have been higher rather than lower than that here obtained. Full credit, therefore, may be given to this Table, wherever, by falling below the average, it proves the failure of a method.

Of the 280 cases, in 58 the peritoneal wound was closed either with or without a drain, with a mortality of 28 per cent. In 20 of these the supravaginal wound was left open with a drain, with a mortality of 40 per cent., while in 30 cases the supravaginal wound was closed around a drain, with a mortality of 13 per cent. In 8 cases the supravaginal wound was left open without a drain. Of these 8, 4 died.

On the other hand, in 222 cases the peritoneal cavity was left open with and without a drain, with a mortality of 22 per cent. In 81 of these cases the supravaginal wound was left open with and without a drain, with a mortality of 23 per cent., while in 141 cases the supravaginal wound was closed, with a mortality of 21 per cent. Of the 141 cases, in 48 cases the supravaginal wound was drawn together, completely, or around a drain, with a mortality of 27 per cent.; and in 93 cases the supravaginal wound was covered by peritoneum, with a mortality of 18 per cent. Of the 81 cases with the supravaginal wound open, 45 were treated with a drain, with a mortality of 24 per cent.; 36 were treated without a drain, with a mortality of 22 per cent. Of the 48 in which the edges of the supravaginal wound were brought together, 44 were treated with the drain, with a mortality of 25 per cent.; 4 were treated without the drain; and of the 4, 2 died. Of the 93 in which the supravaginal wound was covered by peritoneum, 57 were treated with the drain, with a mortality of 21 per cent., and 36 without the drain, with a mortality of 14 per cent.

TABLE III.  
CLOSED PERITONEAL WOUND.

Supravaginal wound open.							Supravaginal wound closed.						
With drain.				Without drain.				With drain.					
	No.	Died.	Rec.		No.	Died.	Rec.		No.	Died.	Rec.		
Billroth, 1879-80,	7	3	4	Brendel, 1882,	1	0	1	Czerny,					
Bompiani, 1881,	1	1	0	Bull, 1883,	2	1	1	1878-81,	8	3	5		
Breisky, 1882,	1	0	1	Teuffel, 1880-81,	5	3	2	Mundé,					
Dudon, 1883,	2	1	1					1883,	1	0	1		
Fenger, 1881,	1	0	1					Staudé,					
Gardner, 1884,	1	1	0					1880-85,	16	0	16		
Howitz, 1882-83,	2	0	2					Taufler,					
Mandillon, 1883,	1	0	1					1881-84,	5	1	4		
Paggi, 1882,	1	0	1										
Schede, 1880,	2	2	0										
Solovieff, 1883,	1	0	1										
Total,	20	8	12	Total,	8	4	4	Total,	30	4	26		
Mortality,	40	per cent.		Mortality,	50	per cent.		Mortality,	13	per cent.			
Total supravaginal wound open and closed.							.	.	.	58	16	42	
Mortality							.	.	.	28	per cent.		

## PERITONEAL WOUND OPEN.

Supravaginal wound open.							
With drain.				Without drain.			
No.	Died.	Rec.		No.	Died.	Rec.	
Bauer, 1881	.	4	2 2	Bernays, 1884	.	3	0 3
Billroth, 1880	.	3	1 2	Billroth, 1880	.	2	0 2
Johannovsky, 1883	.	1	0 1	Caselli, 1882	.	1	1 0
Olshausen, 1881-84	32	7	25	Cushing, 1881	.	1	0 1
Pawlik, 1880	.	1	0 1	Demons, 1882-84	.	7	3 4
Purcell, 1884	.	1	0 1	Engström, 1884	.	2	1 1
Terrier, 1884	.	2	1 1	Hahn, 1881-82	.	5	1 4
Tillaux, 1884	.	1	0 1	Kocher, 1881	.	1	0 1
				Müller, P., 1884	.	4	0 4
				Sänger (L.)	.	1	0 1
				Starck, 1881	.	1	0 1
				Thiersch, 1883,	.	4	1 3
				Weir, 1885	.	1	0 1
				Zweifel, 1882-84	.	3	1 2
Total	45	11	34	Total	36	8	28
Mortality	24	per cent.		Mortality	22	per cent.	
Total				Total	81	19	62
Mortality				23 per cent.			

## Supravaginal wound closed. Edges brought together.

With drain.				Without drain.			
No.	Died.	Rec.		No.	Died.	Rec.	
Bottini, 1881-85.	5	0	5	Goodell, 1884	1	1	0
Mundé, 1883-84.	2	2	0	Wallace, 1884	3	1	2
Schröder, 1880-84	34	9	25				
Solowieff, 1883	1	0	1				
Veit, J., 1883	2	0	2				
Total	44	11	33	Total	4	2	2
Mortality	25	per cent.		Mortality	50	per cent.	
Total				Total	48	13	35
Mortality				27 per cent.			

## Supravaginal wound closed. Peritoneum sewed to vaginal wall.

With drain.				Without drain.			
No.	Died.	Rec.		No.	Died.	Rec.	
Düvelius, 1883-85	4	0	4	Fritsch, 1883-85	24	2	22
Foreman, 1884	1	0	1	V. Herff, 1885	1	0	1
Martin, to 1882	31	8	23	Schatz, 1881-83	10	3	7
1882-84	21	4	17	Sänger (L.), 1883	1	0	1
Total	57	12	45	Total	36	5	31
Mortality	21	per cent.		Mortality	14	per cent.	
Total				Total	93	17	76
Mortality				18 per cent.			
Total supravaginal wound closed				141 30 111			
Mortality				21 per cent.			
Total supravaginal wound open and closed				222 49 173			
Mortality				22 per cent.			

While the good results of Tauffer and of Staude show that complete closure of the peritoneal wound is no obstacle to the success of this operation, Table III. also shows that it is not essential to this success. Apparently complete closure of the peritoneum requires especial precautions or especial skill, as a high mortality has generally occurred where it has been attempted.

The treatment of the supravaginal wound is also a matter of importance. When the peritoneal cavity has been left open, the best results have been obtained where the peritoneum has been united to the mucous membrane of the vagina, closing the supravaginal wound. The leaving the supravaginal wound open, with a drain or without a drain, and the uniting the supravaginal wound around a drain, all show results up to the general average, while the complete closure of the supravaginal wound by approximating its edges without drainage, has had bad results, whether the peritoneal cavity were left open or closed. In general terms, therefore, we should either leave the supravaginal wound fully open, drain the supravaginal wound, or completely seal it by covering it with peritoneum, the weightiest evidence being at present in favor of the latter method.

The previous treatment of the diseased part, the protection of the peritoneal cavity during the operation, and the subsequent use of iodoform, are now matter of routine, the omission of which would be culpable.

The permanent tampon of iodoformized gauze recommends itself as furnishing a disinfecting atmosphere, together with that great gift of antiseptic surgery, namely, rest in the treatment of its wounds.

TABLE IV.  
TABLE OF RECURRENCE.

	Well at the end of about 1 year.	Well at the end of about 2 years.
Bernays (Chip), May 15, 1885	1	1
Demons, Bull. et Mém. de la Soc. de Chir. de Paris	1	1
Dudon (Terrier), Bull. et Mém. de la Soc. Chir., 1885, x. n. 32	1	1
Düvelius, Deutsch. med. Wochen., Feb. 26, 1885	1	1
Martin, Path. u. Ther. der Frauenkheiten, 1885, p. 303	8	8
Novaro, Abst. Br. Gyn. Journ., April, 1885	3	..
Olshausen, Beiträge zur Gyn., 1884, p. 107	7	4
Schatz, Arch. f. Gyn., 1883, xxi. 409	1	1
Staude, Deutsch. med. Wochen., 1883, p. 659	1	...
Tauffer, Arch. f. Gyn., 1884, xxiii. p. 367	2	...
Teuffel, v., Arch. f. Gyn., xix. p. 106	1	...
Trélat, Gaz. des Hôp., July 23, 1885	1	...
Zweifel, Centralblatt f. Gyn., June 28, 1884	1	1
Total	29	18

QUESTION OF RECURRENCE.—From Table IV. of this paper it is seen that 18 cases which have survived the operation have been well at a period varying between eighteen months and two years after. As the reports from which this table was drawn were not made later than the last of 1884 or the beginning of 1885, it is apparent that the cases referred to were operated upon previous to the end of 1882. Referring to Table II., we find that approximately 137 cases were operated upon during that period, and of this number, 97 survived the operation. Of



this 97, therefore, 18, or 20 per cent., were well at the end of eighteen months or two years.

Finding that recurrence is most general within the first year of the operation, cases which remain well at the end of eighteen months or two years are commonly considered cured.

Statistics of cures are, I find, made upon three plans: First, the number in whom recurrence is known are subtracted from the whole number of survivors, and the remainder are counted as cured, and the percentage is computed upon the number of survivors of the operation; second, the number absolutely known to be well only are counted as cured, but the percentage of such cures is estimated only upon the number of survivors whose histories have been followed; and, third, the number known to be well only are counted as cured, and the percentage is estimated upon the whole number who have survived the operation.

It is apparent that great discrepancies in reports can be accounted for by the method in which they have been made out.

In these tables the percentage of cures represents cases known to be well, and is estimated upon the whole number who survived the operation. The percentage of cures would probably have been higher could the number of cures among cases which passed from under observation also have been estimated. Hofmeier remarks that where patients have not reported they have usually remained well.

From Table IV. it appears that one out of five patients who survived the operation has remained well. Schröder and Olshausen obtain a cure in one out of three cases which survive the operation, and Martin, in one out of two cases, a result which is as good, if not better, than that of other operations for malignant disease (see Table V.).

TABLE V.

THE TOTAL NUMBER CURED COMPARED WITH THE RESULTS OF SINGLE OPERATORS, OF OTHER METHODS OF OPERATION, AND OF OTHER OPERATIONS FOR MALIGNANT DISEASE.

	Cases. utilized.	Survived operation.	Per cent. of the survivors who remained well.
Kolpohysterectomy	137	97	20
“ (Schröder <sup>1</sup> )	12	9	33
“ (Olshausen <sup>2</sup> )	23	16	44
“ (Martin <sup>3</sup> )	19	16	50
Vaginal and supravaginal amputation (Schröder <sup>1</sup> )	52	47	32
Galvanocautery amputation (Pawlik <sup>4</sup> )	136	126	21
Amputation with hot iron (Schröder <sup>1</sup> )	13	12	42
Extirpation of the breast (Volkman's klinik <sup>1</sup> )	131	121	15
“ “ (Rose's klinik <sup>1</sup> )	...	...	14
“ “ (Billroth's klinik <sup>1</sup> )	...	...	23
Total extirpations for cancer (Billroth's klinik <sup>1</sup> )	448	...	26
Extirpation of the tongue, pharynx, and rectum (Kocher <sup>1</sup> )	25	...	17
Extirpation of the tongue (Billroth's klinik <sup>1</sup> )	...	...	12.4
Extirpation of the rectum (Rose's klinik <sup>1</sup> )	...	...	...
Kidney extirpation for neoplasms <sup>5</sup>	33	13	...

<sup>1</sup> Hoffmeier, Zeitschr. f. Geb. u. Gyn., 1884, p. 285.

<sup>2</sup> Olshausen, Beiträge zur Gyn., 1884, p. 107.

<sup>3</sup> Martin, Path. u. Ther. der Frauenkheiten, 1885, p. 303.

<sup>4</sup> Pawlik, Wien. klinik, 1882, p. 425.

<sup>5</sup> Billroth, Wien. med. Wochen., 1884, n. 25, p. 774.

OPINIONS REGARDING THE OPERATION.—In Germany, in 1882, Rokitsky's was almost the only dissenting voice. At the present time the operation of kolpohysterectomy for cancer has been, within limits, accepted as a legitimate procedure.

In France, Pollaillon, in 1882, considered extirpation of the uterus an ill-advised operation, quoting West's statistics and the statistics of Freund's operation. In 1885, Pollaillon still prefers amputation, stating that in cancer of the cervix the disease does not early spread to the body, while in cancer of the body the diagnosis is uncertain.

Desprès and Championnière think that permanent cure of cancer of the uterus is impossible, that where the patient has remained well after the operation an error in diagnosis was made.

Demons, on the contrary, in 1883, said that total extirpation of the uterus by the vagina merited a better reception than had been accorded to it in France. It was practised upon subjects already condemned to a fatal issue, with the probability of a more or less prolonged accession of health, and with the possibility of a permanent cure. Demons states that the most usual time for the return is four or five months after the operation, with death at the end of twelve or fourteen months. Return may be in the cicatrix, but more often it is in the pelvic cellular tissue. He goes on to say that women suffer much less from the return than from the primitive growth, that hemorrhage is less frequent and less grave.<sup>1</sup>

Desoubroux, in speaking of extirpation of the kidney for cancer, says: "We must admit that there is a great probability of a return, yet we would operate, because, not to do so, is condemnation to certain death, while in favor of the operation is the fact that for some time after it the patient is comparatively free from the disease."

Terrier places extirpation of the uterus for cancer upon the same plane as extirpation of the kidney for malignant disease. Without being assured against its return, he would operate, because ablation is the only possible curative procedure.

Sebileau remarks: "The operation should be performed because, without it, the patient is doomed to certain death and to a disgusting infirmity; while, if there be a return after the operation, there is less danger of accidents and a diminution of pain."

In England, Duncan favors the operation for carcinoma or sarcoma of the body and cervix. Doran is opposed to the operation on the ground that the disposition of the lymphatics of the uterus is such as to make a radical extirpation of the disease impossible. Playfair thinks the operation of doubtful benefit, as the diagnosis of cancer is necessarily too late for complete removal. Purcell remarks that we should expect no more from extirpation of the uterus than from extirpation of the tongue

<sup>1</sup> Rev. de Chir., 1884, iv. 633.

or rectum for cancer, or from amputation of the breast. Sir Spencer Wells also thinks that we may yet learn much in regard to the technique of the operation, and that it ought not to be condemned.

In the United States, Polk considers the operation applicable only to primary cancer of the body. Where the body has been affected by extension from the cervix, he considers that the glands would have become already involved and thorough extirpation impossible.

Dr. Reeves Jackson, at the American Gynecological Association meeting in 1883, and again in 1885, strongly opposed the operation on account of its immediate mortality, and on account of the probable recurrence of the disease. Dr. Jackson's objections to the mortality list are based not upon the published reports, but upon a number of cases which he knows to have been unreported, and upon a further number of hypothetical unreported cases.

Mundé considers the operation justified in all cases of cancer of the uterus where the uterus is movable and the parametria uninvolved.

Bernays considers that the extirpation of the uterus for cancer will, in the near future, yield results equal to those of extirpation for cancer of the breast.

In general terms, while the advocates of this operation have abandoned the extravagant expectations of former years, they still anticipate of extirpation of the uterus for cancer as good results as those obtained upon other organs, by operations for malignant disease.

INDICATIONS FOR THE OPERATION.—There is general agreement that operation need not be attempted where the uterus is fixed, where neighboring organs are affected, or where enlarged glands can be found. Of 812 cases of cancer seen by Schröder, he found operation indicated in but 160, and total extirpation in but 34 cases. During the last four and a half years Wallace has seen 71 cases, of which but 6 were operable. Bernays has during the last year seen 16 cases, of which only 2 were suitable for operation.

Schröder does this operation only where the body and cervix are affected, doing supravaginal amputation by the vagina where the disease implicates only the cervix, and supravaginal amputation by laparotomy where the body only is affected.

Müller considers total extirpation indicated under each of the three circumstances, the greater mutilation of total extirpation, and the possibility of successful pregnancy in the remnant of the uterine body left by Schröder, being denied.

Ruge and Veit<sup>1</sup> find that cancer of the body tends to spread to the peritoneum, and only appears very late as secondary nodules in the cervix. Cancer of the portio vaginalis tends to spread to the vagina and the lower part of the parametrial tissue, while cancer of the cervix

<sup>1</sup> Zeitschr. f. Geb. u. Gyn., 1882, vii. p. 217.

spreads rapidly on the mucous surface, and early infiltrates the surrounding cellular tissue. Logically, they conclude that supravaginal amputation is indicated in cancer of the body and in cancer of the vaginal portion, in the former by laparotomy, and in the latter by the vagina, reserving total extirpation only for cancer of the cervix, when they say the involvement is too extensive to be otherwise removed, adding, however, that should the mortality of total extirpation diminish, so as to be less than that of partial extirpation, it would be, of course, indicated in preference to partial extirpation in all varieties of uterine cancer.

RÉSUMÉ.—1. The results of kolpohysterectomy for cancer have progressively improved with increase of the number of operations.

2. The total number of operations done up to the present time is approximately 341, with a total mortality of 27 per cent. 222 cases were treated with the open peritoneal wound, with a mortality of 22 per cent. Of the 222, 93 had the supravaginal wound covered by peritoneum, with a mortality of 18 per cent.; and of the 93, 50 were operated upon during the past three years, with a mortality of 10 per cent.

3. Of 97 cases which survived operations done previous to 1883, 18, or 20 per cent., are known to have been well at the end of eighteen months or two years.

4. The latest results of kolpohysterectomy for cancer contrast not unfavorably with those of the total extirpation of other organs for malignant disease.

5. The tendency of medical literature is to regard kolpohysterectomy for cancer as a legitimate operation, subject only to the restrictions common to other extirpations for malignant disease.

In concluding, I desire to express my indebtedness to the New York Hospital Society and to the New York Academy of Medicine, for the use of their libraries in the preparation of this paper; also to Dr. P. F. Mundé, who kindly placed his library at my disposal.

## PRIMARY SARCOMA OF THE RIGHT KIDNEY.<sup>1</sup>

BY WALTER G. SMITH, M.D. DUBLIN, F.K.Q.C.P.I.,

PHYSICIAN TO SIR PATRICK DUN'S HOSPITAL; KING'S PROFESSOR OF MATERIA MEDICA,  
SCHOOL OF PHYSIC, T.C.D.

INDEPENDENTLY of its rarity, the following case possesses some features of interest which appear to be deserving of record:

John D., aged fifty-three years, a brass finisher, was admitted under my care into Sir Patrick Dun's Hospital, October 25, 1884.

<sup>1</sup> Read before the Medical Section of the Academy of Medicine in Ireland, 1885.



His family history was good, and he was not aware of any of his relatives having had "tumour." He escaped syphilis, and had never previously been seriously ill, although up to two years ago he was of intemperate habits, and drank freely of porter. He never suffered from jaundice, but twenty years ago a doctor told him that his liver was getting hard from drink. To the best of his belief he was in perfect health up to about two years ago, when, shortly after his return from America, he perceived a slight pain in the right side below the ribs. This gradually became worse, and some months later he noticed a swelling in the right side. Still he was able to persevere in his employment, which was somewhat laborious, but a month before admission his appetite failed and he gave up work. When in good health he weighed eleven stone, and, although he cannot fix his present weight, is certain that he has lost much flesh, especially within the last six weeks.

Some seven or eight years ago he states that he passed bloody(?) urine, attended with some pain and difficulty. Nothing of the kind recurred until seven or eight months ago, when, without apparent cause, he passed, with pain and difficulty, a "very dark fluid" from the urethra.

The man's aspect is haggard and worn, and he is in low spirits about himself. Physical examination yielded the following results:

*Thorax.*—Heart's sounds normal, rather feeble. Pulse 72. Respiratory sounds quite healthy: complains of some pain between the shoulders.

FIG. 1.

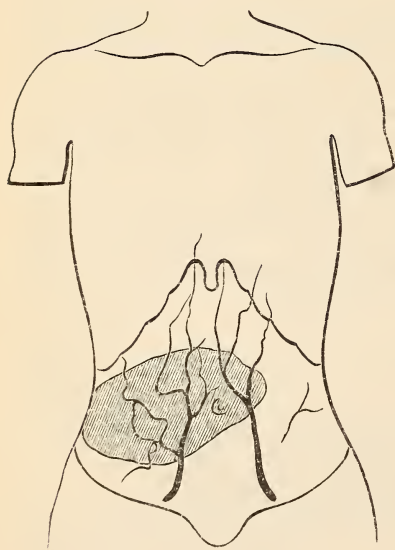
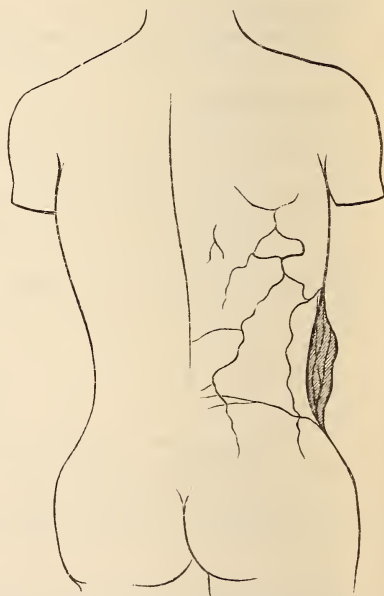


FIG. 2.



Appearance of the cutaneous surface.

*Abdomen.*—Skin white, and, on either side, especially the right, is a network of enlarged veins stretching up to the axilla, and also visible posteriorly. There was no evidence of fluid in the abdomen, but a large

swelling projected on the right side, extending from the ribs to within two inches of the ilium, and laterally about two inches to the left of the umbilicus.

The tumor was firm in consistence, with a well-defined and rounded edge, and the swelling could be felt behind in the lumbar region, but could not be moved from side to side, nor did it follow the motions of the diaphragm.

That the tumor was not connected with the liver was shown by the ease with which the fingers could be pressed into the groove which existed between it and the ribs. No pulsation nor sound could be detected, and after repeated examinations it was impossible to make out any zone of clearness in front.

The tumor, which was diagnosticated as a malignant renal swelling, was uniformly dull to percussion, and it was concluded that no portion of the intestine lay in front of the tumor, this striking exception to the general rule being surmised to be due to the intestine having contracted adhesion to the lower edge of the tumor in an early stage of its growth.

The hepatic dulness was not markedly increased upward, and there was no enlargement of the inguinal or other glands. The testes were unaffected.<sup>1</sup>

His appetite was fairly good; he had vomited frequently before admission, but only once since. The bowels were very costive, and the skin dry.

Neither at the time of his admission nor at any subsequent time was there the least appearance of œdema of the legs or feet. Pain was seldom complained of during his stay in hospital, and the tumor could always be freely handled without causing him distress.

The urine presented some characters of interest. It was usually bright and clear, very acid, sp. gr. about 1.012. It frequently deposited stringy and flaky masses, and the microscope showed numerous mucous corpuscles, and crystals of oxalate of calcium, and sometimes transparent tube-casts, of fair size, and occasionally spiral in form.

Albumen was constantly present in considerable quantity, to about one-sixth. When the clear urine was acidified with a few drops of acetic acid (or solution of tartaric acid, etc.) no immediate change occurred, but after a few seconds cloudy streaks appeared, and the opalescence gradually increased and spread through the fluid until the whole became semiopaque. This opalescence was not cleared away by a gentle heat, and was readily produced even when the urine was previously diluted to two or three volumes. It may be inferred, therefore, that the opalescence was due to the precipitation of a body of the mucin class. When the urine was simply diluted to three or four times its bulk, and allowed to stand, it became milky (globulin?).

No color change with ferric chloride. Tested for indigo substances with strong hydrochloric acid and chloride of lime, it became opaque and of a deep slate-violet color. Floated on cold hydrochloric acid, the latter assumed a violet color which was extracted by chloroform. Boiled with hydrochloric acid it became dark red. It has been already mentioned that the urine was liable to contain flaky shreds, but on December 13th, after slight difficulty in micturition and momentary obstruction,

<sup>1</sup> Niemeyer calls attention to the frequency with which cancer of the kidney is complicated with cancer of the testis, reminding us of the still more common coincidence of tuberculosis of these organs.

he passed a curious looking mass *per urethram*. It consisted of a filiform piece about three inches in length, terminating in a cluster of sacciform tassels. It was mostly white, but in part reddish; and was very elastic. On subsequent occasions he passed numerous other bodies of the same general character, which I preserved in spirit, but during the last few weeks of his life none were seen.

Toward the end of December the tumor had enlarged in every direction, become more prominent in front, and the cutaneous veins more distinct, especially posteriorly. Beyond the latter sign, however, there was no evidence of interference with the abdominal circulation, and the emaciated limbs were quite free from œdema. The bowels did not move except by enema; but, strangely enough, this obstinate constipation yielded after a time, and toward the end of his life the bowels acted naturally.

During the months of January, February, and March, his general condition changed but little, except that he gradually wasted to an extreme degree, his appetite slowly failed, his strength ebbed away, and he died quietly at 10 P. M., on April 14th.

The *post-mortem* examination was made twelve hours after death.

Scarcely a trace of subcutaneous fat was visible. Upon opening the abdomen, not more than an ounce or two of fluid was seen lying in the pelvis, and there were no traces of peritonitis, except a few old fleecy adhesions. Before the position of the viscera was disturbed, it was observed that *no part of the intestines lay in front* of the tumor. The colon was closely adherent to its lower edge. The liver was not displaced or twisted on its axis, an occurrence which has been often observed in other cases of renal tumor on the right side. A large vein crossed the tumor toward the left side, passing from beneath the liver to the great omentum, and a close network of veins was visible on and beneath the loose fibrous capsule which covered the tumor. In some places these veins were continuous with those of the abdominal walls. The hemorrhoidal veins were engorged. The vena cava as it passed under the liver was distended by a large laminated thrombus terminating superiorly in a blunt cone. The right renal vein was likewise occupied by a soft thrombus; the left renal vein was small and free from clot. The large intestine was contracted; the small intestines grayish colored. Mesenteric glands dark, nearly black, and very slightly enlarged.

The spleen was swollen and very soft on section. No infarcts. Liver increased in size, firm, and yielded amyloid reaction with iodine. Anterior surface of its capsule marked with fibrous reticulations.

Left kidney amyloid, scarcely enlarged. Double ureter on left side. There was no calculus in either kidney.

Bladder healthy; contained a soft quadrangular mass similar to what had been passed with the urine during life.

The thoracic viscera exhibited nothing noteworthy, with one exception. The heart was very small, the lungs were free from any secondary disease, but behind the trachea and between the bronchi was a group of lymphatic glands, enlarged, matted together, and infiltrated with white masses resembling malignant deposits. Subsequent microscopical examination showed that the gland tissue was simply in a state of caseous degeneration. Hence it may be said that there was no metastasis or secondary involvement of distant parts.

*Right kidney* was entirely converted into a mass of new growth. It

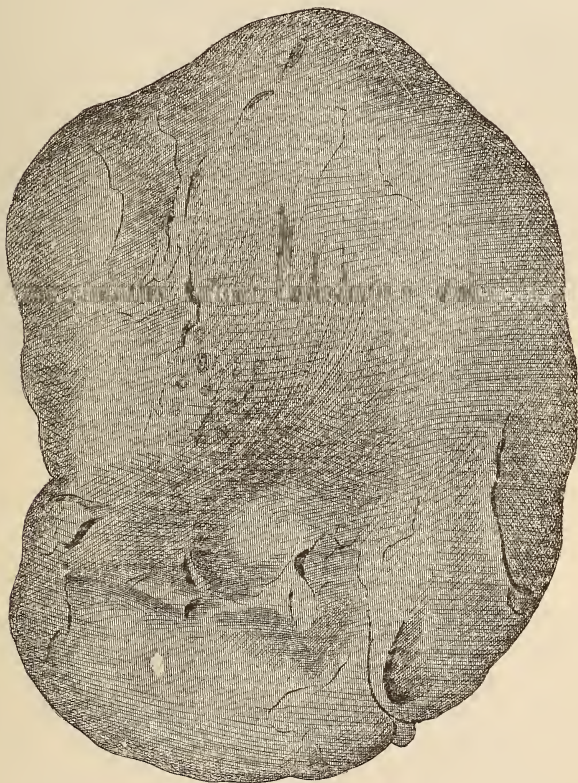


weighed nearly four pounds. The tumor was enveloped in a sort of loose capsule of connective tissue, but was readily separated from adjacent parts. The vertebræ were not eroded.

The ureter was pervious, not dilated. The pelvis of the kidney was occupied by a firm fibrinous plug, which fitted closely and tapered down into the ureter. It was white or yellowish, elastic, and exactly resembled in appearance the clots passed *per urethram*, and when hardened and examined microscopically possessed the characters of a blood-clot.

The right suprarenal capsule was loosely attached to the summit of the tumor, and upon section exhibited a nodule or two of whitish, cheesy material. The renal tumor was divided in its length, and the cut sur-

FIG. 3.



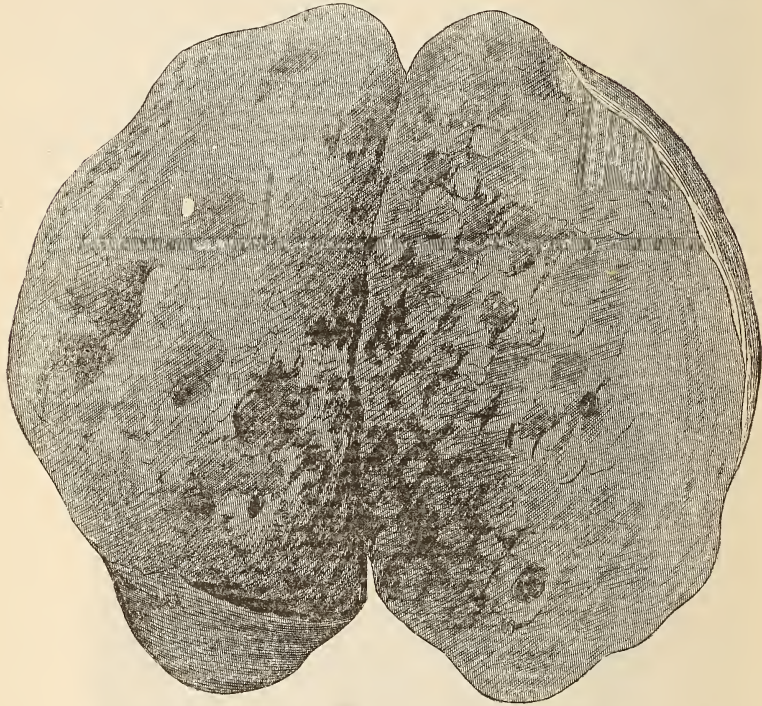
Appearance of right kidney.

faces presented a mottled appearance, traversed by intersecting bands of firm fibrous tissue, forming imperfect loculi. The greater part was of a yellowish-white color, but parts were red and stained with blood, and here and there, areas of a yellow gelatinous deposit were to be seen. Portions of the tumor were hardened for microscopical examination, and I am indebted to my friend, Dr. Henry Bewley, for mounting some slides.



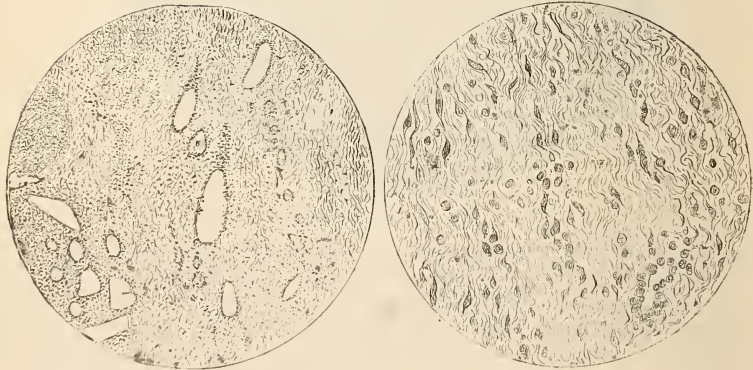
The tumor proved to be a spindle-celled sarcoma, and the appearances are fairly exhibited in the accompanying drawings.

FIG. 4.



Appearance of right kidney after incision .

FIG. 5.



Low power.

High power.

Microscopic sections of tumor.

Good illustrations of the macroscopic characters of malignant disease of the kidney are to be found in Rayer, *Traité des Maladies des Reins*, 1837, Pl. xlv. Fig. 1; Pl. xlvi. Fig. 1; and in Pl. xlvii., which depicts a thrombus in the vena cava, as in my case. Cruveilhier, *Anatomie Pathologique*, 1829, 18e Livr., Pl. 4, left kidney; 18e Livr., Pl. 1, right kidney and adrenal.

The foregoing case suggests a few remarks, and, for convenience, I shall arrange them in separate paragraphs.

1. *Rarity.* Malignant disease of the kidney appears to be of rare occurrence. In Ireland only one or two cases are alluded to in the *Transactions of the Pathological Society of Dublin*, and comparatively few are published in the *Transactions of the Pathological Society of London*. In 1877, I exhibited before the Pathological Society a specimen of a large sarcomatous tumor of the left adrenal, removed from an elderly male subject in the dissecting-room. The left kidney and all the other abdominal viscera were normal in structure.

In the Children's Hospital at Prague, Steiner observed but four cases of renal cancer among 100,000 children, although, as is well known, a notable proportion of the cases occur within the first decade of life.

2. *Diagnosis.* In my case little difficulty attended the diagnosis as to the existence of a renal tumor, the shape of which bore out Sir W. Jenner's dictum, that a diseased kidney preserves its rounded form and never acquires a sharp edge. (For a series of instructive outline diagrams of abdominal aspects of renal tumors, cf. Dickinson, *Renal and Urinary Affections*, III., 1885, p. 710.)

But it is well known that the diagnosis is not always so facile, and competent authorities lay down that swellings of the kidney are perhaps more often the subject of errors of diagnosis than those of any other abdominal organ. Two points in especial are deserving of comment in the above case:

(a) The absence of intestine in *front* of the tumor. Great stress is laid, and properly, upon the diagnostic value of the clinical fact that the colon almost invariably lies in front of a renal swelling, and Dickinson remarks that the exceptions are so rare that they have the interest of *lusus naturæ*. A case of Dr. Bridges is quoted by Dickinson (p. 717), in which a malignant tumor of large size of the right kidney grew in such a way that it entirely excluded the colon from any contact with the front of the tumor. The exceptions, when they occur, are more likely to be met with on the *right* side, because the colon on the right side is not so closely connected with the kidney as on the left. The colon is attached to the posterior abdominal wall higher and more extensively on the left side than on the right (cf. Landau on *Movable Kidney in Women*, New Syd. Soc., 1884). The bowel is never found in front of an enlarged spleen, and suprarenal tumors are not necessarily crossed by bowel.

(b) The numerous fibrinous clots which were passed at intervals for some weeks. These were mostly elongated and decolorized, and some vermiform in shape, evidently moulded in the ureter. According to Dickinson, ureteric casts are infrequent.

It may seem strange that, while these fibrinous clots were repeatedly passing out with the urine, yet no trace of blood was discovered in the urine on more than one occasion when it was looked for. The explanation appears to be this: The conical fibrinous coagulum which plugged the pelvis of the kidney and mouth of the ureter being slowly urged on from behind by the pressure of the increasing new growth, and by accretion of the clot posteriorly, bits of the plug were from time to time broken off, and so found their way to the bladder. The plug, like a tight valve, fitted the orifice of the ureter so closely, that nothing could escape past it, and hence the absence of hæmaturia. The non-occurrence, however, of hæmaturia does not count much one way or the other in a diagnostic point of view; for, taking Roberts's, Ebstein's, and Dickinson's statistics, we arrive at the conclusion that, roughly speaking, hæmaturia occurs in scarcely half the cases of malignant renal disease.

It might be asked why did not the kidney dilate, or at least cysts form, if the ureter were completely obstructed, and the reason probably was that, owing to the total destruction of the glandular renal tissue by the invading new growth, no secretion of urine occurred, the left kidney doing the entire work. Judging from the cases on record, it seems to be the exception to find the whole of the kidney tissue replaced by the neoplasm.

3. *Character of the urine.* (a) *Albuminuria.* This was persistent throughout, and varied little in amount. During the patient's lifetime it was inferred, and correctly, that this symptom betokened disease, probably non-cancerous, of the left kidney, which, it will be remembered, was afterward found to be affected with amyloid degeneration. The coincidence of malignant disease on one side, and amyloid degeneration of the other kidney, is noted by Ebstein as of very rare occurrence.

(b) The persistent excretion of a mucin-like substance. The urine, clear and free from viscosity, upon acidification with any acid, invariably yielded a turbidity, which gradually developed and increased in degree, and was not cleared away by cautiously warming.

4. The *absence of either ascites or œdema* of the legs is noteworthy when we consider the size, position, and weight of the tumor, and the fact of the thrombus in the vena cava, not to speak of the coexistence of amyloid disease in the other kidney.

5. *Feasibility of operation.* Metastatic deposits are stated to have occurred in seventeen out of forty-one cases collected by Dr. Bertram Windle,<sup>1</sup> and in the light of the post-mortem evidence I regret that the

<sup>1</sup> Primary Sarcoma of the Kidney, *Journal of Anatomy and Physiology*, vol. xviii.



question of surgical interference was not more seriously entertained during the patient's lifetime. From the autopsy it appeared that, considering the nature and attachments of the tumor, the chance of a successful result from operation would not have been inconsiderable. A successful use of nephrectomy for round-cell sarcoma of the right kidney in a boy aged three is reported by Mr. Croft, in the *Lancet* for May 23, 1885; and in the same journal for August 15, 1885, is an unsuccessful case of operation by Mr. Whitehead for sarcoma of the right kidney in a man aged forty-six years. Death from peritonitis ensued on the fourth day. A list of cases in which the operation has been performed is given by Mr. Baker in *Trans. Med.-Chir. Society*, vols. 63 and 64.

6. *Histological nature.* It is curious to note the vagueness and diversity of statement among recent authors upon this point. Thus Roberts (*Urinary and Renal Diseases*, 4th ed., 1885, p. 575): "The species of cancer found in the kidney is almost invariably the encephaloid (fungus hematodes), and scirrhus is very rare in the kidney." Ebstein refers the majority of cases to scirrhus carcinoma; and Wilks and Moxon (1875) state that "carcinoma is the kind of cancer most commonly present in the kidney." They do not allude to sarcoma.

The fact is that scirrhus, though often spoken of, is rare as a renal growth. Malignant tumors of the kidney have been so generally described as cancer that Dickinson (loc. cit.) was much surprised to find, upon examining a number of specimens, that cancer, as structurally defined, was comparatively rare among them. "By far the larger number of malignant renal growths fall within the definition of sarcoma;" and Windle (loc. cit.) remarks that the "definitiveness of sarcoma of the kidney has only been recently recognized."

Of eight tumors catalogued as cancer in the Museum of St. George's Hospital, two of which were specified as scirrhus, six proved to be not cancer, but sarcoma; the term "scirrhus" having been applied in each instance to a hard sarcomatous growth. A profusely cellular, highly malignant, round-celled sarcoma is the most common of all renal growths (Dickinson). But the spindle-celled variety of sarcoma is also known to occur, and the case I now record is a good example of this kind of growth.



SUCCESSFUL RESECTION OF INTESTINE IN A CASE OF  
STRANGULATED FEMORAL HERNIA.

BY J. CLARK STEWART, M.D.,

LATE HOUSE SURGEON MOUNT SINAI HOSPITAL, NEW YORK.

RECORDED operations of this character are sufficiently rare to justify reporting the following unusual case :

F. G., a Russian Jew, æt. 68, was admitted to Mount Sinai Hospital on May 4, 1885, suffering from a strangulated hernia, and, through the kindness of Drs. W. F. Fluhrer and D. M. Stimson, visiting surgeons, I was permitted to operate on the case.

The following history was obtained : The patient has had a femoral hernia, on the right side, for the past twenty years, always reducible, and easily controlled by a truss. Three days ago, in the morning, patient went to stool without his truss, and after forcing down hernia by straining, was unable to reduce it, and soon began to suffer great pain. During this and the next day several physicians repeatedly employed taxis without relief. Three enemata were also given, which brought away a small stool. After this the patient complained of more pain, and began to vomit, at first the contents of stomach, afterwards mucus and bile. These symptoms continued through yesterday, and this morning there are in addition hiccough, and some swelling of lower abdomen. Patient has eaten nothing since emesis began, and has become very dejected and stupid.

Previous history very good. No serious illness. No venereal trouble.

*On admission :* General condition of patient is fair, though he is weak. His pulse is slow, about 70, and intermits irregularly. There is marked atheroma of arteries. Tongue is coated and dry, countenance heavy and dull. Temperature 100.4°. Patient vomits intermittently a brown offensive fluid almost fecal in odor.

In right femoral region, just below Poupart's ligament, and extending upward under same, is a roundish tense tumor about two inches in diameter, having the spine of the pubes to inner side, and the femoral artery deep behind and to outer side. The skin over this tumor is reddened, œdematous, and apparently adherent. Pressure is very painful, resonance slightly tympanitic, no fluctuation, no impulse on coughing. Lower abdomen is enlarged and tympanitic, but not tender on pressure.

*Operation at 8 P. M.* Primary ether anæsthesia was used, prolonged by the use of morphine hypodermically. Carbolic acid solution was used for cleansing the skin, and for the instruments, and solutions of bichloride of mercury for irrigation.

An incision was made over the tumor, and the sac on being opened was

found to contain a small quantity of dirty brown serous fluid, mixed with fecal matter and flakes of fibrin. This was removed, and sac and wound thoroughly irrigated with 1 : 2000 bichloride solution. The stricture at the neck of the sac was then relieved by nicking with a knife, and stretching with the finger, and several inches of intestine pulled down and examined.

The strangulated portion was found to consist of a knuckle of gut about three inches long, on the convex surface of which was a diverticulum about one inch in diameter, having a small ragged opening at its extremity. The walls of this diverticulum were very thin, as the mucous membrane of the gut was here destroyed, leaving only peritoneum, and some dilated veins. The gut beyond the strangulation appeared healthy, though quite congested and œdematous, especially on the proximal side.

The gut was then seized with hæmostatic forceps on either side of the diseased portion, which was then excised, about four inches being removed, the corresponding mesentery having first been ligated in segments with strong catgut, about half an inch from its attachment. The tissue in the grasp of the forceps was also removed, and after ligating all bleeding vessels the two extremities of the gut were united with fine catgut, using Lembert's suture. The cut edges of mesentery were also sutured, leaving the ligated portion lying in a fold above. Especial attention was paid during this part of the operation to preventing the entrance of any fluid into the peritoneal cavity, and also to keeping the protruded gut warm.

All exposed parts were now freely irrigated with warm 1 : 3000 bichloride solution, and the gut was returned into abdomen without difficulty. The sac was then ligated at its neck and cut off, and the external wound sutured, after putting in a rubber drain. Wound was dressed with iodoform gauze over incision, covered with a thick pad of bichloride gauze, and bandaged firmly.

Only four ounces of ether and eight minims of Magendie's solution were used for the anæsthesia, the operation lasting two hours.

At 11.30 P. M. the patient showed no shock, and felt well. Does not vomit. Temperature 98°; pulse 72; respiration 16. Was given cracked ice and Seltzer water during the night.

5th. Twelve hours later. Patient feels quite comfortable; he has not vomited since operation; has passed flatus per anum in large amount. Took three cups of milk and a moderate quantity of ice and Seltzer during the day; also had gr. ij ext. opii per rectum. Temperature 8 A. M., 100.4°; 5 P. M., 102°; 11 P. M., 101.2°; pulse 84-87; respiration 16 to 18.

6th. Patient is comfortable, and only complains of pain in external wound. Temperature remained about 100° all day. Food the same as yesterday, with the addition of whiskey and sarco-peptones.

8th. No change. Patient feels too well for his own good, as he wishes to get up. Fearing that his restlessness might have disarranged dressing, it was changed. Wound appeared healthy, and there was superficial union.

9th. Patient was very restless last night, and, during the absence of the orderly he got out of bed, and attempted to have a stool. This morning, in spite of opium, he accomplished his end, and passed without pain a large soft stool, containing no blood.

10th. Had two formed stools during the day. Otherwise about the same.

11th. Wound was dressed, and found entirely healed, except the opening for drainage.

14th. Had two stools to-day, without pain. He coughs a little, and a few coarse râles can be heard over left lower lobe. Since the 8th instant patient has been growing delirious, and is very restless, especially at night. He constantly tries to leave his bed and go to the closet, and at times must be tied to keep him in bed. Anodynes have been thoroughly tried, but with little effect, and the excitement and physical exertion have weakened him greatly, so that it has become necessary to increase his food and stimulants.

From this time on, the patient gave us all a great deal of trouble. Besides his delirium, his lungs, kidneys, and heart gave us at different times cause for anxiety. At one time he utterly refused to eat, and for several days was nourished by enemata of pancreatized milk. As soon as possible he was got out of bed and made to take a little exercise, and after this steadily improved.

During the week ending May 30th he had daily stools, was about, ate and slept well, but his mind still wandered. He failed to recognize his friends, and had many hallucinations.

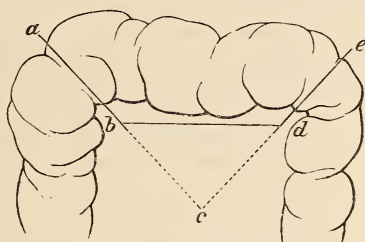
On June 5th, one month after the operation, he was discharged well in body, though not in mind, but ten days later returned on a visit sane.

Sept. 30. He was well. Has had no trouble with hernia since operation. No constipation.

I was much interested in reading at this time a report, by Mr. Mitchell Banks, in the *Lancet* of April 25th, of a somewhat similar operation, but I was able to gain little aid in the treatment of my case, as that used by him would have inevitably killed my old Russian. Four days of ice diet, eight days more on ice and small amounts of beef-juice, with confinement of the bowels till the twenty-third day, contrast strongly with the large amounts of liquid food and stimulants required to keep alive a feeble old man. The moving of the bowels on the fifth day, and so frequently afterwards, was not intentional, but non-preventable, owing to the negative effect of opium in any form or dose on his bowels.

The only peculiar feature of the operation itself was the non-excising

of the V-shaped piece of mesentery usually recommended. This was to avoid the chance of cutting off any blood-supply to the remaining gut, which is mentioned by Treves as one of the dangers of the V-incision.



*ace*, Usual section. *abde*, Actual section.

However, if more gut had been excised, I should have been obliged to use the V, as a greater bulk of mesentery would have been difficult to reduce.

As to the propriety of resecting the gut in this case, instead of opening and leaving it *in situ*, as is generally advised, I may say that my hospital experience of the latter measure had been so discouraging as to make any alternative preferable. Out of twenty herniotomies during my service, two showed gangrenous gut, which was opened and left *in situ*, both patients dying early from septicæmia, and in one of these cases, a well-conditioned male, the impression was strong on every one connected with the case, that resection of the gut would have given him a better chance.

I think that most readers will agree with me that the resection of gangrenous intestine in strangulated hernia is not such a forlorn hope as it is usually represented to be, when an old man, too stupid to understand his danger or his chances, and in bad condition physically and mentally, recovers after such an operation performed with the hospital house-staff as operator, assistants, and advisors.

MINNEAPOLIS, MINN., October 24, 1885.

## A CASE OF DISSECTING ANEURISM OF THE THORACIC AND ABDOMINAL AORTA.<sup>1</sup>

BY JAMES E. GRAHAM, M.D.,

JOINT-LECTURER ON PRACTICE OF MEDICINE AT THE TORONTO SCHOOL OF MEDICINE, TORONTO, CANADA.

THROUGH the kindness of Dr. Richardson, of Toronto, I am enabled to describe this very interesting and rare specimen. Dr. Richardson has

<sup>1</sup> Read before the Canada Medical Association.

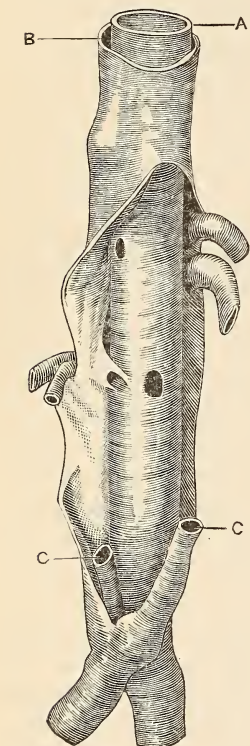


made the dissection in such a way as to show the principal points of interest.

The patient from whom the specimen was taken was a prisoner in the Toronto jail, and died there. He had been in his earlier days a soldier in the British army. During the Crimean War he received an internal injury while working in the trenches. According to his own account, he was not able to work afterwards; and having been examined by the surgeon, was invalided. He was told that he would have to avoid overexertion, and that he might die suddenly at any time. After he left the army he improved in health, and has since been able to earn his living, although he has not been strong. He was known to Dr. Richardson for some years as an occasional inmate of the jail. He complained of pain in the chest on left side, and the diagnosis of aneurism was made during life.

A few days before his death he suffered from pulmonary hemorrhage of severe character. A second attack proved fatal.

The *post-mortem* examination revealed the following condition: The ascending and transverse portions of the arch of the aorta were very much distended, the result, no doubt, of the partial obstruction. Immediately beyond the exit of the left subclavian a saccular dilatation was found, which was intimately adherent to the lung. A rupture had taken place in the portion, and the blood found its exit through the bronchial tubes. In the distal portion of the sac there were two openings, one of which was continuous with the natural lumen of the aorta (A), and the other communicated with the dissecting aneurism (B). The latter was made by the blood finding its way through the middle coat of the vessel, and dissecting the



A. Aorta.  
B, Dissecting aneurism.  
C, c, Lumbar branches.

intima and inner portion of the media from the outer portion of the media and the outer coat. This was continued almost completely around the vessel, and extended throughout the whole length of the thoracic and abdominal aorta. Toward the lower portion of the abdominal aorta there existed a large opening through which blood could pass from the dissecting aneurism back into the aorta proper. This opening was the natural outlet into the right renal artery, and remained after the outer had been torn away from the inner coat. Two or three smaller openings similar in character were found higher up. Some of the arteries open into the dissecting aneurism without any corresponding opening into the main artery. The openings must have at one time existed and have gradually become closed up. At the line of junction between the aneurism and the arteries were found a number of cords, which were no doubt remains of the circular fibres of the middle coat, and had gradually become thickened. At the lower part the dissecting aneurism ended in

a *cul-de-sac* just above the bifurcation. The two orifices c c represent lumbar branches.

This case presents many points of very great interest.

(1) The length of time the patient lived after the first formation of the aneurism, a period of more than thirty years. Dissecting aneurisms are generally considered to be of a very fatal character. In this case the strain was taken off by the opening low down between the artery and the aneurism, which rendered it possible for the blood to flow readily back into its old channel. Erichsen speaks of such openings as the result of atheromatous disease; but in this case the openings were those which had already existed at the point of exit of the various arteries. I have not found the description of any case with such openings.

(2) The extent of the aneurism. It extends throughout the whole length of abdominal and thoracic aorta, and more than half the circumference of the vessel. It is not so unusual to find very extensive, diffuse dissecting aneurism, formed by the blood's finding its way between the outer coat and the sheath of the vessel.

(3) The closing of openings in the inner coat, at the exit of arteries from the aorta.

(4) The corrugated appearance of the inner surface of the aneurism.

In Holmes's *System of Surgery*, under the head of dissecting aneurism, reference is made to Dr. Peacock's contribution. He, Dr. Peacock, has shown that a layer of the middle coat is left exterior to the blood-current. This is clearly shown in this specimen.

A very interesting case has been reported by Dr. Swayne, of York, England, in which the diagnosis was made during life. He lived three months after the commencement of the process of dissection. Its extent was about the same as the one presented.

Erichsen divides dissecting aneurism into three classes: (1) In which the blood, after passing some distance through the substance of the middle coat, bursts through the outer coat. This is the most common form. (2) In which an opening takes place at the lower extremity between the aneurism and the main artery. (3) In which a sac forms between the inner and outer coats, and rupture through the outer finally takes place.

According to this classification, the case presented would belong to the second class, but is unique in the form of opening existing between the artery and the aneurism.

A very interesting case was reported by the late Dr. Hilton Fagge, which must have resembled this one very closely. In it the inner lining of the aneurism became so perfect that it could scarcely be distinguished from that of the aorta itself.

The case before us is an excellent example of the restorative power of nature, and demonstrates the possibility of the enjoyment of years of fairly good health in one suffering from an extensive dissecting aneurism.

## NOTES TOWARD THE FORMATION OF CLINICAL GROUPS OF TUMORS.

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THE time has, I think, arrived when it is both possible and desirable to make, for practical purposes, a much more detailed classification of tumors than has yet been attempted. Some grouping of the kind I refer to is needed, both for purposes of prognosis, and in order that we may lay down good rules for treatment.

Such grouping must be accomplished chiefly by observation of external features of similarity, and of resemblance in general tendency. It is these conditions, rather than minute histological differences, which will be of chief assistance to the surgeon; or, perhaps, it may be convenient to have two classifications side by side, the one clinical, the other histological, and let the two help each other at all points where mutual help is possible. The surgeon cannot much longer content himself with the groupings which the microscopic pathologist offers him. During the past quarter of a century, he has perhaps waited more than was wise, and expected more than was possible. Not that I would for a moment speak disparagingly of the labors of histologists, or of the results which have accrued from them.

These labors have been vast and most meritorious, and the results splendid. Still, however, I return to my statement that the revelations of the microscope in reference to new growths are inadequate to the needs of the practitioner who has to deal with them, and that the latter will, in most instances, help himself better by setting to work at accurate and detailed clinical observation. The microscope has succeeded in establishing the fact that rodent ulcer is epithelial cancer, but meanwhile the ulcer in question keeps true to the first clinical descriptions given of it by Jacob, and Brodie, and is as different as possible from the more common forms of epithelial cancer as we see it in the lip, the tongue, and other parts. The disease to which the term rodent or Jacob's ulcer is, or was formerly, given, is not, however, by any means, the only very peculiar form of malignant growth which occurs on the face, with which surgical observers are familiar. There is another form of ulcer very different indeed from it, inasmuch as a rapidity of growth is as definitely its characteristic as slowness is of common rodent.

For this, also, so far as I know, pathologists have no other name than epithelial cancer, although it has distinctive features, both in its mode of growth and in its external appearance. This ulcer I have been in the habit of recognizing as "the crateriform ulcer," a name which denotes its peculiar appearance after ulceration has occurred. It shows



but little tendency to return after excision, and does not quickly affect the glands. It is clinically not in the least like rodent ulcer, nor any of the ordinary forms of epithelial cancer. I mention this disease now, just by way of example. In the malady to which Hebra gave the name of rhino-scleroma, we have, possibly, another good instance of the outstripping of the histologist by the practitioner. The latter declares, apparently upon good grounds, that the disease in question has very distinctive features, and the former admits that he can discover nothing in the least peculiar in its tissue structure. Whilst, then, we may accept the large, I had almost said unwieldy, groups constructed for us by the microscopic pathologist, his *carcinomata*, *sarcomata*, and *epitheliomata*, the task will yet remain for the surgical observer to bring this huge mass of material into something like orderly arrangement by careful observation among his patients.

It is not my intention, in the present paper, to attempt the ambitious task of presenting an arrangement of new growths based upon their clinical features and like histories. Such a task would find work for a lifetime. I am, however, so convinced both of its desirability and of its practicability in the future, that I shall be bold enough to venture a few hints and detached memoranda, which may possibly prove helpful toward its attainment at some future time. It would seem, in the first place, to be most desirable for us to take careful note of all rare and exceptional forms of new growth.

Every one who has engaged in original observation must have been struck with the fact that conditions of extreme rarity and of apparently almost unique peculiarities will be found, if our sphere of observation be but large enough, and our patience sufficient, to have their exact counterparts. Only wait, and we find ourselves able to parallel, and sometimes with extraordinary exactitude, conditions which, at first sight, had seemed not in the least likely to be repeated. Thus we become convinced of the fact that not only in common maladies, but in the rarest, the forces of production are acting in methods which insure uniformity of result. Examples of this occur in the most instructive manner in the instance of new growths. Good illustrations of it—that is, of the exact repetition of unusual peculiarities—may be witnessed in cases of melanosis attacking the nail-bed, of melanosis on the heel, of leucoma asperum, of the tongue, in the growths (epithelial) which occur in the late stages of Kaposi's disease, and very many others. I shall presently have to describe in detail some other good examples as witnessed in tumors of bone, multiple fibroid tumors, and the recurring round-celled sarcoma of skin. Thus, then, the plan should be to take any example of rare disease, and keep it by itself until others similar to it are found, and thus construct groups which, in turn, may become large enough to allow of our determining, without much risk of error, what are the differential peculiarities



of the malady. Instead of trying to merge rodent ulcer in epithelioma, keep it rigidly apart, and note also the differences from each other with various examples of rodent present, with the hope of determining whether there be not sub-groups well worth construction.

A general law may be noted for our guidance in clinical observation in this matter. It is, that we may expect exact repetitions of structural peculiarities whenever the morbid tendency displays its activity in precisely similar regions; rodent ulcer is again our easiest illustration of this, occurring, as is well known, almost solely in the face with such preponderance in one special region that it gained the name, when first recognized, of "peculiar ulcer of the eyelids."

Why should epidermic or epithelial cancerous action, when it displays itself on the upper part of the face, produce a sore having the peculiarities of rodent, whilst, if on the hand or foot, or even on the neck or chest, it would be attended by quite different ones. The sides of the nose, the eyelids, and the cheeks, are the appropriate territories for rodent ulcer. If the lips, any part of the ears, or any part of the neck be attacked, it is highly probable that the disease will at once deviate from the peculiarity of rodent and affect the lymphatic glands earlier.

I have long been familiar with a very peculiar tumor growth which affects the upper part of the neck. A lump resembling a potato forms quickly, but painlessly, under the upper part of the sterno-mastoid muscle. Probably it begins in the lymphatic glands; it is a single, hard, nodular mass. It bulges on both sides of the muscle, is very firm, and presents great bossy projections on its surface. The clinical course of this tumor is rapid growth, ulceration, a fungous mass, hemorrhage, and death within six or eight months of the beginning. It is, I believe, a lympho-sarcoma in histological language, but I know of no other regions of the body in which a precisely similar kind of tumor occurs. I have seen at least a dozen examples of it, and they are all very much alike. Its subjects are usually healthy men of middle age. They are always primary, always on one side only, and never cause growths elsewhere. They kill by the rapidity of their local growth.

The tendency to produce in the same part of the body exactly the same morbid conditions is impressively illustrated in two drawings which I possess, representing sections of the lower end of the femur after amputation. The two drawings are so exactly alike that it might be thought that they had been taken from the same specimen. They show the formation of a cystic myeloid sarcoma within the condyles, expanding them, and the lower part of the shaft. One of them was taken twenty-five years ago, from a young woman, whose thigh was amputated after several months of slow growth. Her case is published in the *Pathological Society's Transactions*, and also in my *Clinical Illustrations*. The other had an almost precisely similar history; the patient being a young

man, whose thigh I amputated in the London Hospital a few years ago. Both patients are, I believe, still alive; and the cases are, in all respects, close parallels.

I have no other drawing of myeloid in any other bone in the least resembling the conditions shown in these two, nor do I recollect ever to have seen a specimen or a patient whose history closely approached them.

The melanotic sarcoma, when beginning in the sole of the foot, runs a very peculiar course. Of this, again, I have two drawings, which might be mistaken for each other. The disease is usually under the middle of the tread of the heel. There is so little of pigmented growth that it is necessary to look most carefully to find any; but if you do look well, there will always be seen a few little streaks and patches in the skin at the edge of the ulcer which resemble lunar caustic stains, and are often mistaken for them. The disease consists in an ulcer from which a sprouting mass grows up, which consists of unpigmented sarcoma. In this disease the lymphatic glands are implicated with great certainty, and early, and the prognosis, however trivial the local disease may appear, is very bad. I have recently attended three patients with melanosis in this position, and they all ran exactly the same course.

A very interesting and peculiar group is constituted by the symmetrical fatty outgrowths formerly described by Sir Benjamin Brodie and others, to which Mr. Marrant Baker has recently given much attention. The microscope reports that they are chiefly fat, with some admixture of fibrous tissue, but they deserve a clinical designation, since they are wholly different in course and tendency from other examples of the fatty and fibrous groups. These tumors grow symmetrically, and always occur first in the suboccipital regions. These subjects are always men, and usually free drinkers of beer. In some instances, nervous disturbances, irascibility, etc., attend them. They vary in size at different times, and rest, abstinence from beer, and residence in the country, will often rapidly produce considerable diminution. They often grow to a size which gives to their possessor quite a grotesque appearance. In severe cases, not only the back of the neck, but its sides, and the sides of the face, and the shoulders, may be affected. A few cases observed by myself would appear to show that simultaneous with the fatty outgrowth there may be a definite tendency to hypertrophy of glands, both of lymphatic and those of specialized function, as, for instance, the salivary and lachrymal.

In women, so far as I know, these fatty outgrowths in the back of the neck are not met with. Women are liable, under parallel circumstances, that is, in middle life, and often with peculiar nervous disturbance, to the formation of fat masses symmetrically placed deeply in the root of the neck. These growths vary much in size, with the health and place of residence of the patient.

*(To be continued.)*

## ANEURISM OF THE ASCENDING AORTA,

PERFORATING THE CHEST-WALL, AND FORMING AN ENORMOUS EXTERNAL  
PULSATING TUMOR IN THE RIGHT PECTORAL REGION; TREATMENT  
BY ELECTROLYSIS, FOLLOWED BY ARREST OF GROWTH;  
DEATH; NECROPSY.

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THE case which forms the subject of this paper is, I think, worthy of being placed on record for two reasons: First, because of its unusual clinical features, striking in themselves; second, because it illustrates a method of treatment, here followed by useful results, of which the number of recorded cases is limited, and particularly so in English and American medical literature.

Mary M., aged seventy-four, widow, Irish, formerly a domestic, but for many years an inmate of the "Out-wards" as a pauper, was admitted to the medical ward in the Philadelphia Hospital June 16, 1885, on account of "a hard pain in a lump in her breast." The following notes were taken upon her admission to the ward by my clinical clerk, Dr. Elder:

She is a stout, large-framed woman, of more than medium height, with a hard face, a doughy skin, and an abundance of coarse yellowish-gray hair. She knows nothing of her people, except that her father died before she was born, her mother shortly afterward, and that she had no brothers or sisters. She was always healthy, and can remember no serious sickness of any kind. She bore one child that died in infancy, but upon this subject she is indisposed to talk, and will not tell whether she has been married or not. It cannot be determined that she ever had syphilis; there are no scars of syphilitic lesions. She has been intemperate, and declares that she was never sick at all, except after spells of excessive drinking.

She tells us that the pain in her breast came before the "lump." The former she has had, "off and on," for three years. It was first felt after a fall. The exact account is that she tripped in walking across the floor, and fell with great violence, striking her breast upon a block of wood. She was a great deal shaken up, but soon recovered. Shortly after this the pain came on. It has never been constant, but comes in spells in the middle of the breast, shooting at times toward the right shoulder and to the back. At other times it is more prolonged, and of a dull, aching character. This pain, however, became so distressing that she was transferred to the hospital. After a time she became weary of the restraint of the ward and asked to be discharged, although the pain was not much better. In November, 1884, a small circumscribed tumor made its appearance, somewhat to the right of the sternum, and about the level of the third costal cartilage. She was again sent to the hospital, when the diagnosis of aortic aneurism was made. The tumor at this time is described as being half the size of a hen's egg. For reasons of her own, she again left the ward and returned to the almshouse.



From this time the tumor gradually increased in size, and the pain became more severe. She began to lose rest, but her appetite continued good, and her general health was but little impaired.

Upon her last admission to the hospital (June 16, 1885) the tumor had already attained large dimensions. It occupied the whole of the sub-clavicular and much of the mammary region of the right side, extending from the margin of the sternum to the anterior axillary fold, and from just below the clavicle to the fifth intercostal space. It was irregularly circular in outline, with abrupt margins, and of a maximum elevation in the central portions of about 2 to  $2\frac{1}{2}$  inches. The upper or clavicular margin was deeply notched, and from the angle of this notch a shallow furrow extended downward and slightly toward the right, dividing the upper surface of the tumor into two lobes, one of which pointed toward the sternal notch, the other toward the shoulder. At several points the surface was marked by slight circumscribed elevations or bosses, two of which, namely, one in the sternal border and one at the upper and outer or acromial border were of a brownish-blue color, and much less resistant upon palpation than the surface elsewhere, which was, however, compressible at all points upon moderately firm pressure. To the eye, the surface of the tumor appears to be continuous with the mamma, but palpation discovers the lower margin above the base of the fifth rib, well marked, abrupt, and continuous with the circular border, as elsewhere defined.

The greatest vertical measurement, from margin to margin, over the convexity of the tumor, was about 8 inches; the greatest transverse measurement, about  $8\frac{1}{2}$  inches; the longest oblique diameter, from the border nearest the shoulder to the lowest point of the sternal border, was  $9\frac{3}{4}$  inches.

The tumor was everywhere the seat of a strong, expansile, heaving, systolic impulse. The skin, as well as the deeper tissues surrounding its base, was very tender to the touch. There were no external signs of inflammation.

The heart was displaced slightly downward and to the left. Its impulse was of moderate force. There were no murmurs having their point of greatest intensity near or at the apex. At the base of the heart, over the right second costo-sternal articulation, there was heard a loud double murmur. This bruit was distinct over a somewhat limited area, which included a small part only of the tumor at its upper and sternal border, and was soon lost in the line of the carotid and subclavian arteries. It was faintly heard behind in the right supra- and interscapular spaces. At the lower part of the tumor auscultation revealed the presence of a harsh, low-pitched, but not very loud systolic bruit, which was also restricted to a limited area. The upper and outer portions of the tumor beyond the limits indicated, yielded upon auscultation a distinct systolic shock, accompanied by a faint sound like the cardiac second sound and wholly without murmur.

The præcordial percussion dulness was continuous with that of the tumor, and with flatness in the upper sternal region. There was dulness anteriorly on the right side beyond the limits of the tumor, and relative dulness on the right side posteriorly, less marked over the lower than over the upper lobe. Occasional mucous and subcrepitant râles were heard upon auscultation over the lungs. In other respects, the physical signs betrayed no lesion of the left lung.



The radial and carotid pulses, sixty-eight to seventy-two per minute, were alike in time, volume, and force on the two sides, with retardation as compared with the apex beat. The patient refused to have sphygmographic tracings taken. The pupils were alike and responded equally to light. There was no stridor. At rare intervals there occurred moderate paroxysms of dyspnoea. Cough was infrequent and usually attended with scanty, thin mucous expectoration. There had been no blood-spitting. Dysphagia was constant but not severe. The veins of the face and neck were not engorged. The temperature taken in the axilla was normal.

DIAGNOSIS.—Aneurism of the ascending aorta, perforating the chest-wall and forming an external consecutive false aneurism.

TREATMENT.—Absolute rest in bed; restricted diet with as little fluid as practicable; potassium iodide gr. x *quatuor in die*, and for the relief of pain morphinæ sulphatis gr.  $\frac{1}{4}$  *p. r. n.* The last was used twice or thrice daily during her whole stay in the ward. The iodide was also given during the greater part of the time, being on two or three occasions only exchanged for chloral hydrate gr. vijss *ter in die*. Neither of these drugs appeared to exert any favorable influence in relieving pain, nor could it be seen that they favored clot formation. But this question was, under the circumstances, difficult to determine.

Ten days after admission the tumor had undergone a considerable increase in size. The notch upon its upper border, and the sulcus described above as extending from this notch, had disappeared. The measurements, which had been made from and to fixed points marked upon the skin with nitrate of silver, were found to have increased by four-fifths of an inch to an inch and one-fifth and the mass was more protuberant. The pulsation had become exaggerated and at one or two points the discolored skin threatened to yield to the internal pressure of the blood. The tenderness was such as to render any attempt to support the tissues externally by strapping or a pad impracticable.

I determined to try electrolysis. The patient was with difficulty persuaded to submit to this treatment, which was, however, carried into effect on the 28th of June.

The battery used was a modification of Stoeber's with Flemming's zinc-carbon elements. The electrolytic needles were of steel,  $2\frac{1}{8}$  inches in length, straight, elliptical in transverse section,  $\frac{1}{16} \times \frac{1}{25}$  of an inch in diameter, insulated to within  $\frac{7}{25}$  of an inch of the point, which was very sharp, flattened, and heavily gilt. All the apparatus was supplied by Mr. Flemming, who also rendered valuable personal assistance at the operation.

The patient was carefully informed of the nature of the procedure and cautioned against movement of any kind. Her usual quarter-grain hypodermatic dose of morphia was administered beforehand and the bed placed in a good light.

Two needles connected with the positive pole were slowly introduced into the tumor at points some distance from its upper and lateral borders. They penetrated half their length,  $1\frac{2}{5}$  inches, the points being freely movable within. A large electrode covered with a thin layer of fine-grained sponge, well moistened and connected with the negative pole, was held firmly against the lower border. The battery was then put into action, five cells being at first employed and the number rapidly increased to ten, fifteen, and finally twenty cells, with a current strength estimated by Mr. Flemming at twelve millampères.

With this number of cells the current, as tested beforehand by placing the metal tips of the conductors in white of egg in a saucer, in a few minutes formed a small, dense, translucent coagulum around the positive pole, and a large white, opaque, loose clot, the size of a marrowfat pea, around the negative pole.

The patient suffered much pain upon the introduction of the needles, and at each increase in the number of cells. An attempt to use twenty-three cells caused suffering so intense that it was at once abandoned. The current of twenty cells was kept up thirty-five minutes. At the end of this time there was no appreciable diminution in the force of the pulsation; nevertheless the sufferings of the patient were so great that it was thought best not to prolong the application.

The needles were withdrawn slowly and with a rotary movement. A few drops of blood followed the one nearest the shoulder. The points of both were much eroded. For twenty-four hours cold water compresses were constantly applied to the tumor.

*June 30.* It was noted that there has been less pain than before the operation, and the pulsation seems less forcible.

*July 18.* Less pain and no increase in size until within the last four days. There is rapid extension of the mass at its axillary border; skin much discolored, bluish, very sensitive; patient obliged to lie with the arm extended, to avoid touching it; wall at this point very thin; pulsation much stronger than elsewhere.

*20th.* Electrolysis was performed for the second time. As there was little apprehension of danger from embolism, it was determined to connect the needles with the negative pole, in order to secure at each point as large a coagulum as possible without regard to its texture.

Three needles were introduced: one into the thin-walled upper axillary border, one into the upper sternal border, and one into the lower sternal border. The large sponge-covered electrode was held firmly against the lower and outer border of the tumor. Twenty cells were used from the beginning. At the end of twenty-eight minutes the pulsation throughout the tumor was much diminished; in thirty-three minutes the needle at the upper sternal border had ceased to move with the cardiac rhythm; that at the lower sternal border moved but slightly; while the excursion of that in the upper axillary border was much restricted. In forty-five minutes the movement of the needles had almost ceased. The *séance* was continued one hour.

In the case of one needle only, that at the upper axillary border, was the withdrawal followed by bleeding. Here a little jet followed, which was, however, easily controlled by a compress, with the loss of not more than one fluidounce of blood. A cold water dressing was used as before. No inflammatory action supervened. The pulsation again increased after some hours, but was never so violent as before, nor did the tumor undergo further increase in the direction of its axillary border, although there was some general increase in its bulk up till the time of the patient's death, which occurred from exhaustion on the 8th of September, some weeks after the ward had been transferred to the care of my colleague, Dr. Neff.

*Autopsia Cadaverica*, by Dr. E. O. Shakespeare, Pathologist to the Hospital, nine hours after death. External appearances: Slight yellowish tinge of upper extremities; noteworthy appearance, that of large rounded prominence of right mammary gland and supramammary region. Its

vertical diameter measures 8 inches, its transverse,  $8\frac{1}{2}$  inches; its most prominent point is  $3\frac{1}{2}$  inches above the level of the ribs. It extends transversely from the sternal border to the anterior axillary line, and vertically from a line just below the clavicle downwards about 8 inches. The skin over this prominence is not discolored, except at two points near the middle of its sternal border. The mass is moderately firm to the touch.

Thorax : Left pleural cavity normal, with the exception of moderately firm adhesions over posterior portion of lower lobe of left lung. Of the left lung the upper lobe is normal, the lower consolidated posteriorly. . . The lower right lobe is normal; the middle lobe very firmly attached by its upper and anterior surface to the wall of the chest and to the upper lobe; it is crepitant. The right upper lobe is compressed, and is firmly adherent to the chest-wall, so that it is torn in the attempt to remove it.

Pericardial sac obliterated by old but not very firm adhesions. Heart not opened. The right anterior wall of the thorax, together with the hemispherical tumor, was removed with the heart and vessels attached, for further examination. It was found upon entering the finger into the ascending portion of the aorta, that it was the seat of aneurismal dilatation and that there was a large aneurismal sac to the right.

Liver slightly enlarged. Its cut surface brownish-red and friable. Spleen normal. Kidneys normal in size; capsules easily stripped off; surface granular; upon section, cortex seems to be of unusual thickness and pinkish-gray in color.

A further examination which I made at a later date discovered the heart to be slightly increased in size, its muscle-substance normal; mitral leaflets sound; aortic leaflets thickened and crumpled. The aorta was extensively atheromatous, and was somewhat dilated in all its diameters, from the sinuses of Valsalva up to and including the lower part of the transverse portion, with a large sac springing from its right wall and forming an intrathoracic aneurism somewhat larger than the heart itself. This sac had greatly compressed the upper and middle lobes of the right lung and had contracted very firm and dense adhesions to the surrounding structures. It had also by pressure upon the ribs, caused displacement with crowding and extensive erosion of the second, third, and fourth ribs, the second and fourth being widely separated and the third entirely absorbed for a considerable part of its extent anteriorly. The wall of the sac had given way at the point of adhesion to the chest-wall, forming an oval opening much smaller in its diameter than the aneurism itself, by means of which the blood had found its way beneath the muscles and fascia of the chest-wall and formed the external or consecutive false aneurism which was so striking a feature of the case.

The intrathoracic aneurism contained but a small quantity of laminated clot; the external tumor was densely filled with firm laminated clot, in which, however, at the time of my examination some weeks after death, no traces of the foci presumably caused by electrolysis could be discovered.

This case belongs to the group in which traumatism plays an important part in the etiology of aortic aneurism. The pain, which was the principal and most characteristic subjective symptom, was first felt shortly after the violent fall in which the chest was struck against a block of



wood. It is usual to ascribe the lesion in these rare cases to the sudden strain brought upon the walls of the artery, in consequence of the effort made by the patient in falling to save himself rather than to any direct injury to the arterial coats.<sup>1</sup> It appears to me that in this case the blow, leading, as it must have done, to forcible compression of the aorta, at the moment already overfilled by the sudden effort to avoid the fall, greatly increased by its direct effect the already excessive arterial pressure and so caused the walls to yield, not in the direction of the blow, but laterally. Old age and alcohol had without doubt rendered the arterial coats peculiarly incapable of bearing such a sudden strain.

Scarcely less worthy of note than the enormous size of the aneurism both inside of and outside of the chest-wall, is the almost complete absence of pressure-signs. This is to be explained by the direction taken by the sac from the right antero-lateral aspect of the ascending aorta, and affords a striking example of the immunity from pressure which the important structures of the mediastinum may enjoy in thoracic aneurisms of even exceptional size.

The case was a peculiarly favorable one for the use of galvanism. The tumor was external, of very rapid growth under observation, and there was such straining of the walls as to make the danger of rupture imminent. While there were no means of knowing the exact mode of its communication with the intrathoracic sac, still it was evident that the opening was somewhat constricted and that the risk of embolism must be slight. Nevertheless, at the first *séance* I selected the positive pole on account of the firmer clot which it causes. This attempt was followed by at best only a partial success, for the reason that the foci of coagulation were probably too small. Nor do I now think the time—thirty-five minutes—was sufficiently long. The second *séance* may be regarded as, under the circumstances, altogether successful. During the time that the three needles remained in position and connected with the battery, pulsation almost ceased. To be sure, it returned, but it was never again so violent or so extensive as before. Nor did it possess to the same extent its former expansile character. The mass, it is true, increased afterward somewhat in size, especially in thickness, but this increase was very slow and the measurements after death were little different from those at the date of the second operation. From that date, also, the disposition to dangerous local bulging was arrested. Moreover, from that period the consistence of the tumor was at all points notably firmer.

Notwithstanding the theoretical objections urged against the introduction of needles connected with the negative pole, the results in this case indicate its superiority to that method in which they are connected with

<sup>1</sup> See also Bramwell: Diseases of the Heart, 1884, pp. 699, 700.



the positive pole, when it is sought to promote the rapid coagulation of a large mass of blood in an external false sac. The relative merits of these methods as compared with the alternate method of Ciniselli, or the introduction of needles connected with both poles, as advocated by Duncan, Balfour, and others, can only be determined by a critical analysis of the recorded cases.

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## TREATMENT OF INTESTINAL OBSTRUCTION BY THE FORCE-PUMP.

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THE treatment of intestinal obstruction is still, to-day, an unsettled question. The method of treatment first devised, that by cathartics, is universally condemned. Sir Thomas Watson thus forcibly expresses himself upon this point: "Withhold purgatives in those cases because they are not merely useless, but positively hurtful—hurtful not only in the late, but in the early stage of the obstructive process; not merely condemned by an experience which is sometimes equivocal, but contra-indicated by whatever rational principles can be deduced from the physiology and pathology of the malady."<sup>1</sup> Dr. Syer Bristowe expresses himself in a similar manner: "Here, as in most other kinds of obstructive disease, all forms of purgatives must be eschewed, everything, in fact, must be avoided which can have the effect of promoting peristalsis; for violent movements of the bowels, independently of any other mischief they may effect, naturally tend to increase the size of the intussusception."<sup>2</sup>

Though it can be justly claimed that the treatment by cathartics is based upon a rational principle, that of promoting peristalsis, and thereby a righting of the difficulty, nevertheless it is sufficiently well established by experience that such a method is attended with the greatest dangers, liability to light up a most dangerous inflammation and ulceration, and even cause perforation of the bowels by the violence of the contractions, for only the most powerful of this class of remedial agents could prove of any avail. Furthermore, experience has shown that in some cases<sup>3</sup> where they have been administered they have proved totally ineffective, as if nothing more than so much water had been taken.

<sup>1</sup> Watson's Practice of Medicine.

<sup>2</sup> Reynolds's System of Medicine, article "Obstruction of the Bowels," by John Syer Bristowe, M.D., F.R.C.P.

<sup>3</sup> Well illustrated by Case I. in this paper.

The other method is that by opium. Though this is the one most favored and usually resorted to, being the safest so far as causing any trouble *eo ipso* is concerned, it has certainly no other *raison d'être* than that of keeping the bowels quiet and quieting the pain, trusting to the *vis medicatrix naturæ* to cure the patient by its own unknown and invisible methods.

The treatment by belladonna suggested by Prof. Brinton has not come into general use. Though successes have been reported with it, still many authorities ignore it altogether; *e. g.*, Mr. F. Treves in his Jacksonian prize essay on this subject.

Another and most important question has arisen lately in connection with this disease and one that has a most important bearing upon the plan of treatment to be pursued, namely, the question of operation. Abdominal surgery, to-day, has certainly made the greatest strides forward, and the opening of the abdomen is an everyday occurrence.

It is certainly a pertinent question, if so many and grave diseases as are known to the gynecologist can be successfully treated by an operation, if that gravest of diseases, acute peritonitis, can be treated by surgical interference, and with such remarkable success as reported by Lawson Tait,<sup>1</sup> why should not the same be the case with intestinal obstruction? Though it is true that the statistics of the operation undertaken for this cause are certainly not very favorable and in no way compare with the favorable showing made by ovariectomy, or even by the operation for strangulated hernia, still it cannot be denied that this is in a great measure due, not to the operation *per se*, but, as I venture to believe, to the lateness of its performance. In obstruction of the bowels the conditions are altogether different from those of the various other affections, and time certainly plays a most important rôle. If the condition of things be such that an operation is the only means by which the disease can be cured, then this remedy must be applied early to be successful. The liability to severe inflammation, exudation, formation of adhesions, of pus, and severe general shock, makes a delay of even a few hours of the greatest importance, for an operation which a little earlier might have been positively successful may now, a few hours later, be fraught with great danger to the life of the patient.

There can, therefore, be no question that if operative procedure is to be invoked it should be done very early. But here we are met with the objection that many cases recover without an operation, and as there is always a certain amount of danger attendant upon an operation, why should this additional danger be thrust upon the patient?

<sup>1</sup> British Medical Journal, 1885. Nine cases of acute peritonitis treated surgically by Lawson Tait; the abdomen freely opened, the surfaces of the intestines carefully washed of the pus and other fluid exuded, and proper drainage carefully established. Union Médicale du Canada, September, 1885.

The great difficulty attendant upon the whole plan of treatment lies therein, that the forms of occlusion presenting themselves to us, that due to impacted feces excepted, are difficult of exact diagnosis. On this point Mr. Nelson C. Dobbs thus remarks: "The mere recital of these forms of obstruction might almost lead one to suppose that the question of determining the precise cause of the occlusion in any given case might be a simple matter, but in actual practice it is by no means easy. There is much yet to be learned and perfected in the way of diagnosis before the surgeon can hope satisfactorily and scientifically to relieve these cases by an operation. I have no intention myself to attempt anything like a differential diagnosis. I am conscious that in the present state of our knowledge the most we can do in many cases is to determine the actual existence of acute intestinal obstruction, and in some instances, perhaps, its seat, but in most the precise anatomical lesion that determines the occlusion cannot be diagnosed whether it be by bands, or acute kinking, or other cause."<sup>1</sup>

It is certain that there are cases wherein nothing but surgical interference can relieve the patient. Such are where the obstruction is due to *compression* or *traction*, where the bowel becomes obstructed by the compression, or the pressure, or the traction exerted upon it by adhesions, or growths, or deposits situated externally to it, and in which there is no contraction inherent in the walls themselves, or where it is due to *internal strangulation*, where the bowel is constricted or nipped by the edges of some natural, or artificial orifice through which it protrudes.<sup>2</sup> The cases of obstruction should, therefore, so far as treatment is concerned, be classified under two heads:

1. Cases which can be relieved by medical treatment.
2. Cases which require operative interference.

As already stated, the line of demarcation, from a diagnostic standpoint, between these two great divisions is not so sharply drawn as to be always readily discernible, and, as a rule, a great many medical trials are made and much precious time wasted before the fact is recognized that by surgery alone can we hope to save our patient.

It is, therefore, a great desideratum that the treatment employed should be such as to determine quickly one of two results—either the cure of the patient, or the clear indication that operative interference is absolutely necessary. At the same time this treatment, though effective, should be of such character as in no way to prejudice the case and endanger the success of an operation should this become necessary.

Have we any remedial means at our disposal that can accomplish this? To demonstrate that we have such, is the object of this paper.

<sup>1</sup> Proceedings of the Bath and Bristol Branch of the British Medical Association, *Bristol Medico-Chirurgical Journal*, March, 1885.

<sup>2</sup> Reynolds's System of Medicine, article "Obstruction of the Bowels"

It is to-day a recognized fact that enemata are the treatment *par excellence* for intestinal obstruction, and if other remedies and methods be still resorted to, it is owing to the fact that the ordinary instruments employed for this purpose are not powerful enough, and therefore do not answer the purpose. To obviate this difficulty various adjuvants have been employed to aid the instrument in accomplishing its object. In 1869 Dr. Thomas Hay, of Philadelphia, in a long and excellent article,<sup>1</sup> sought to revive the use of the long tube introduced by O'Beirne. Without questioning the ability of the author of that article, there cannot, nevertheless, be the slightest doubt that it is a procedure requiring, to say the least, the greatest dexterity to pass the tube beyond the sigmoid flexure, and in a majority of cases it will be found impossible. In a discussion upon this subject Mr. Treves,<sup>2</sup> the author of a prize essay on "Intestinal Obstruction," says as follows: "It is of interest to note that many surgeons still cling, in a spirit of simple and trustful faith, to the 'long tube.' They appear to regard it as a kind of fetish, as an inanimate thing to be invoked as a last resort when in dire distress. History tells us that this remarkable pipe has been passed many feet into the colon, that it has reached the transverse colon, and that it has found its way even into the cæcum. I can only say that the adventures of this tube and the anatomy of the colon do not quite agree; there is a discrepancy somewhere, and, of course, it may be that the bowel is at fault. After many patient trials upon many dead bodies I have not yet succeeded in passing this interesting pipe beyond the sigmoid flexure. Several feet of it have disappeared within the anus, and its tip has been felt about the umbilicus and even the right iliac region, but the mobile sigmoid flexure has explained it all, and beyond that loop the good tube has not passed."

In the discussion Mr. Mitchell Clarke expressed himself in the same tenor. "He was very glad to hear that an opinion he had long held with regard to the long tube (O'Beirne's) was shared by so high an authority as Mr. Treves. It is well known to members of this branch that he had long held that it was very difficult, if not generally impossible, to pass this tube through the sigmoid flexure of the colon. . . . Subsequently some experiments were made in the post-mortem room of the Bristol Infirmary, and it was found that the tube could not be passed."

In *La France Médicale*, of June 5, 1884, we find a report by Dr. Poupon, Interne of Hospitals, describing the relief of a case of intestinal occlusion by means of what may be termed an electrical enema, or, better, an enema charged with electricity. It is as follows:

"A young man, aged twenty, after drinking a glass of wine was seized with violent colic and bilious vomiting. On his admission into the hospital his

<sup>1</sup> Medical and Surgical Reporter, Philadelphia, November 6, 1869.

<sup>2</sup> Bristol Meeting of the Bath and Bristol Branch of the British Medical Association. Bristol Medico-Chirurgical Review, March, 1885.



face was pinched, his pulse small and frequent. An inspection of the epigastric region revealed a rather voluminous tumor starting from the right flank and extending into the left hypochondriac region following the course of the transverse colon. Diagnosis, intestinal occlusion. Two siphons of seltzer water were injected into the rectum, and faradization applied, but without success. Equally fruitless were hypodermic injections of morphia and the applications of ice. The belly was very much distended, and the pain intense. Before resorting to a surgical operation, Dr. Budet, of Paris, was requested to administer an electrical enema." This is the method as described by Dr. Budet himself at a medical congress in Vienna, Oct. 6, 1883. It must be premised that the doctor employs only galvanism for the reason that faradic currents give rise to a rapid knotty contracture, whilst galvanic currents produce but a slow contraction, that tends to propagate itself onward. "One difficulty arrested me in the use of the galvanic current; these currents have in reality a very intense chemical action, capable of rapidly disorganizing the tissues at the points where they come in contact with them. But to be efficacious it is necessary to employ very energetic currents and to bring them in direct contact with the intestine, whence the danger of producing eschars of the parietes of this organ. I then devised a particular intestinal excitor. It consists of a large rubber sound provided with a hollow metallic mandrel (like the wire running in the ordinary vulcanized rubber catheter) connected by a supple wire with one pole of the battery. This mandrel does not reach further than about one centimetre above the lateral orifice of the rubber sound. The external end of the mandrel is connected by means of a rubber tube of sufficient length to an ordinary irrigator filled with salt water. The sound once introduced, the water is injected, the mandrel serves as a conductor of electricity, and transmits the same to the water, which then bathes the intestines to a considerable extent. In this manner all danger of the cautery is avoided, and currents of even enormous intensity may be thus employed. The other pole of the battery is placed over the region of the kidneys or abdomen, according to the case under treatment."<sup>1</sup>

It is clear, therefore, that as to the first method it is the opinion of competent medical men that it is entirely valueless. As to the second method, without going into the question as to whether it is really an electrical enema; whether the salt water, once out of the tube, and therefore not in contact with the current-conveying body, really carries the galvanic current on with it or not, it is sufficiently apparent that the method, though perhaps applicable in hospitals, is one attended with the greatest difficulties in private practice—difficulties that are at times insurmountable.

An enema to be effective in the treatment of this disease must be possessed of two qualities; this, in my opinion, is a *sin qua non*.

1st. It must have penetrating power to pass beyond the ileo-cæcal valve and into the small intestines.

2d. It must be possessed of sufficient force to produce peristaltic action.

1. It cannot be questioned any longer that, with a suitable instrument, water can be thrown beyond the Bauhinian valve. Prof. Felix Niemeyer states this explicitly in his *Handbuch der Speciellen Pathologie und Therapie*.<sup>2</sup> Prof. Rothacker, Pathologist to the Cincinnati Hospital,

<sup>1</sup> Gazette Médicale de Nantes, No. 9, July, 1884.

<sup>2</sup> Handbuch der Speciellen Pathologie und Therapie. Prof. Felix Niemeyer. 9th edition, vol. i.

has demonstrated this fact in the post-mortem room of the hospital.<sup>1</sup> In a paper presented to the American Medical Association, at its meeting in Buffalo, June, 1878, entitled "Permeability of the entire Alimentary Canal by Enema, with some of its Surgical Applications," Dr. Robert Battey, of Rome, Ga., asserts the permeability of the entire alimentary tract by enema, and verifies his statement by the recital of his own clinical observations and experiments upon the cadaver. In this interesting paper are quoted cases reported by others, and among them the excellent observation of Dr. T. S. Mitchell, of Hamilton, Ga. This latter gentleman remarks in his paper as follows: "To satisfy myself of the full permeability of the canal, I returned the following day, and injecting a half pint of castor oil into the rectum, followed it with a large injection of warm water until vomiting occurred. The patient distinctly tasted the castor oil in the vomited fluid, and the oil globules were abundantly floating upon the ejected liquid."<sup>2</sup> My own clinical experience has fully convinced me that water can be directly forced beyond the valve of Bauhinus with a suitable instrument.

Lately a lecture, delivered by Prof. W. W. Dawson,<sup>3</sup> wherein a contrary statement is made, has been quite extensively quoted. Prof. Dawson, in demonstrating to students how far up into the bowels an injection could be thrown, was very much surprised to find that it went beyond the valve into the ileum. He was astonished, as it was but the second time in fourteen experiments that this had occurred. As to the first time he says: "When I first saw the valve yield, Dr. Louis C. Brown, Demonstrator of Anatomy at this Institution, used a powerful syringe; the fluid passed from the large to the small bowel without arrest, from thence on through the stomach and œsophagus until it appeared at the mouth." Without any investigation, however (which could have been very easily made), as to the condition of the valves in the first case, without any investigation into the condition of the valves in the case before him, but basing himself merely upon the twelve cases in which he had not succeeded, he concludes: "The experiments I have given show that the valve when intact—when in normal condition—will not allow retrograde passage. In the case before you, and in that of Dr. Brown, the valve was doubtless imperfect."

To this statement of Prof. Dawson, in view of the preponderance of evidence both clinical and experimental, in view of his own two successes, no weight can be attached, and until he shall have demonstrated upon the cadaver the truth of his hypothesis we shall hold to the contrary opinion, that fluids can be thrown past the ileo-cæcal valve, and that the cause for his twelve failures must be sought for elsewhere than in a

<sup>1</sup> See note to article "Remarks on Intestinal Obstruction." By H. Illoway, M.D., N. Y. Medical Record, No. 27, Dec. 30, 1882.

<sup>2</sup> Virginia Medical Monthly, Oct. 1878, containing synopsis of Dr. Battey's article.

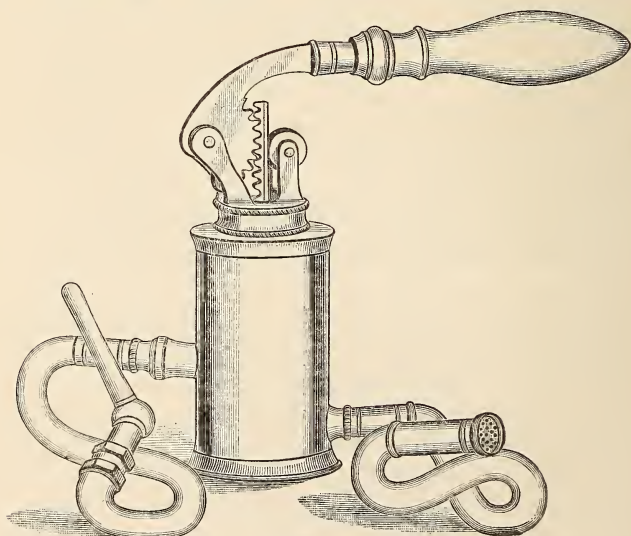
<sup>3</sup> Lancet and Clinic, Feb. 21, 1885. Lecture by Prof. W. W. Dawson, M.D.

supposed normal condition of the valve; most probably in the use of weak or faulty injecting instruments; too great cadaveric rigidity; perhaps in some pathological condition that would have been discovered had search been made.

2. Trousseau says: "You can readily understand how intestinal occlusion may be the consequence of this invagination. It is not, however, an inevitable consequence, for a vigorous contraction of the intestine may suffice to reëstablish the normal condition."<sup>1</sup> It is a well-established fact that in many cases, it might be said in almost the greater number, there supervenes a condition of paresis of the muscular structure of the intestinal tract from sudden distention of the parts by large quantities of gas, a usual concomitant of many forms of obstruction; from pathological changes inhibiting the action of the nerves; from long-continued pressure of hardened feces. The peristaltic action, proper and normal, capable of righting the difficulty is thus inhibited.

It is, therefore, absolutely necessary that the enema should have such powerful exciting influence on the muscular structures and on the inhibited nerves as to produce normal, easy, imperceptible peristaltic action.

It happens also frequently that, later on in the course of the disease, nature seeking an outlet for the accumulated material, or from direct excitation produced by remedies administered, a reversed peristaltic action of the parts above the seat of difficulty occurs, and we have vomiting.



Force-pump.

This is a grave condition, and generally hastens the fatal result. To bring relief even to so serious a condition, there must be enough power in the enema to reverse this action—to bring it back to its normal form.

<sup>1</sup> Trousseau, Clinical Lectures, article Int. Obstr., vol. ii. Philadelphia, 1873.



The peristaltic action here referred to, which is absolutely necessary for the relief of the case, is the gradual, undulatory peristalsis of the healthy state, and not the violent, knotty, and painful contractions produced by powerful cathartics.

The instrument possessing these qualifications, and therefore adapted to the treatment of this disease, is the force-pump. The one used by me in the treatment of the cases here recorded, has a cylinder three inches long and six inches in circumference (see figure). It is supplied with a suction and delivery pipe. It is operated by a handle to which is attached the segment of a gear-wheel; this meshes in a rack, which is part of the piston rod. It has a stroke of one and a half inches.

This pump throws a continuous, unbroken stream. It is evident that great force can be exerted with such an instrument. It has power enough to throw the stream beyond the ileo-cæcal valve and up into the small intestines, as shown by Case I. It possesses force enough to stimulate the intestinal tract and provoke peristaltic action where even the most powerful cathartics had failed, as recited in Case I., and even where the action had been reversed, vomiting ensued, and the patient seemed near his end, as in Case II.

CASE I.—In December, 1878, I was requested by my friend Dr. Keck to see with him a case of intestinal obstruction. A boy, aged fourteen, of German parentage, was the patient. He was of flabby habit, rather dull, neither working nor studying, living on cakes, coffee, and slops, and not much given to substantial food. The doctor had been called two days before, and learned a history of what he supposed, at the time, to be ordinary constipation. He ordered him a laxative. This did not act. He then directed pills containing extr. colocynth co., grs. xij, and calomel, grs. xxiv. He took all, and still no action. He was then ordered *six drops* of croton oil in pills. This proved no more effectual than the other remedies.

I examined the abdomen carefully, and found about the region of the umbilicus an elevation which was rather sore on pressure. The boy also complained of pains shooting out from this spot. My diagnosis was intussusception.

I had at one time noticed in the office of the late Dr. Holdt a syringe constructed like a pump, and throwing a continuous stream with considerable force. I advised against any further medication, and suggested to my colleague that I would procure the above-mentioned instrument, and that we should try enemata. We returned in the evening, Dr. Holdt kindly loaning me his instrument. I threw into the bowels nearly a basinful of cold water—in fact, so much that the patient cried out that he could no longer bear it. He got upon the chamber, and the water passed from him, very much colored with fecal matter. Five minutes thereafter we gave him another injection, until he cried he could not hold it any longer. This time he had a large fecal evacuation—very fluid, of course, from the large quantity of water injected. We now ordered him quinia in one grain doses, with tinct. nuc. vom., and left him. In the morning we found him much improved, his bowels had moved several times during the night, and once in the morning. In three days more he was up and about.



CASE II.—Mr. F., aged seventy, an old gentleman, hale and hearty, very active, and a good eater; much subject to flatulent colic. I had treated him at various times for these attacks, and always succeeded in relieving him by a hypodermic injection of morphia,  $m_x$  to  $m_{xv}$  Magendie's solution, nothing further being required. He stated that when these attacks came on, it seemed to him as if something had knotted in the right hypochondriac region.

In the winter of 1880 I was called to see the old gentleman, who was again complaining of an attack of colic. I gave him a hypodermic injection of morphia. Next morning early I was summoned to him again, and found that he was still suffering severely. I ordered him a pill of opium, half a grain, and extract hyoscam., half a grain, to be taken every two or three hours, as the severity of the pain might demand. This was continued for two days. He now had difficulty in micturition, passing but little urine, and that with much pain. The pains in the bowels still very severe. Vomiting of biliary matter had set in. Dr. Forchheimer was called in consultation. He examined the case, and we agreed upon a purgative in the shape of calomel and jalap. This was at two A. M. In the morning I visited my patient, and found his condition very bad. Countenance anxious, and expressive of great agony. Continued vomiting of biliary matter; small, feeble pulse. He had summoned his children, in the expectation of speedy dissolution. The powders were vomited almost as soon as swallowed. His wife, upon her own responsibility, had administered to him during the night about twelve injections, both from a fountain and Davidson syringe. None of these injections, she assured me, had passed from him. I had brought with me (by the kindness of Dr. Holdt) the same syringe which had previously proved so effectual. Fearing to add to the shock in this case, I determined to use hot water. I accordingly had a large china washbowl, full of water, brought in, cooled it to the temperature of  $106^{\circ}$  F., and then proceeded to pump him full, until he could hold no more; whilst he rubbed himself about the umbilicus and said he felt the water go all through him. He got upon the chamber, when the injection passed off with a large discharge of gas. Five minutes later I gave him another injection, of about the same quantity as before; this time, however, the temperature of the water was  $90^{\circ}$  F. This was very soon discharged with some fecal matter, and considerable quantity of flatus.

He now felt much better. The pain was very much relieved, and the vomiting arrested. I then waited fifteen minutes and gave him another injection, water at  $106^{\circ}$  F. This soon passed away, with considerable fecal matter and gas; pain completely relieved. I now left him, directing him to take some beef broth and brandy at intervals. Returned in the evening, and found him doing very well; had had two more evacuations since morning; passed urine freely; had taken the beef broth and brandy with great relish. Completely relieved of pain. There was considerable soreness over the abdomen; more so in the right hypochondrium. He felt very much prostrated. He was now ordered a tonic, kept on light nutritious food, and in a week was on his feet again, attending to his duties as usual.<sup>1</sup>

CASE III.—August 24, 1883, at 5 A. M., I was called up to go and see Mr. I. A. He was suffering with the cramps, the messenger said. I

<sup>1</sup> These two cases were published in a brief article on this subject in the Medical Record of December 20, 1882. They are republished here that the chain of clinical evidence in favor of this method may be complete.

immediately armed myself with my hypodermic syringe and proceeded to the house. Mr. I. A. is a gentleman of about fifty years, of stout habit, and quite an expansive abdomen. He had formerly gone through considerable illness, but of late years had been quite well. He is methodical in his habits as to diet and rest. Reaching the house, I found the old gentleman in bed, restless, and shrieking with pain. Examining the abdomen, I found a marked elevation in the right iliac and hypochondriac regions, extending very nearly to the median line. Upon slight percussion, such as was only possible under the circumstances, this region was found markedly tympanitic. The patient screamed for relief from the atrocious pain that was tearing him to pieces. I administered a hypodermic injection of  $\mathfrak{m}\mathfrak{xv}$  Magendie's solution of morphia. A quarter of an hour elapsed, and no relief. I administered another hypodermic injection of the same strength. Still no relief; the patient continued as before. I now proceeded to give him rectal injections with an ordinary Davidson's syringe, which I found in the house. The fluid passed away from him, but there was no improvement. I administered about half a dozen such injections, varying them with oil, with turpentine, with salt, but the condition remained as before, with this aggravation: that the patient, who is rather of *nervo-sanguine* temperament, was becoming greatly alarmed at the failure to relieve him.

I now realized that I had a case of intestinal obstruction to deal with, of the ileo-cæcal variety, and at once sent for my force-pump. Till now about two hours had elapsed, with the various fruitless attempts and manœuvres. The syringe brought, I got a china basin (one of the kind that usually comes with chamber sets) about three-fourths full of hot water, temperature  $103^{\circ}$  F., and, adding a little salt and about twenty drops of spirits of turpentine, proceeded to pump my patient full. I injected into him nearly the whole quantity of water. He got upon the chamber, the water began to pass, then suddenly there was a loud discharge of flatus. Observing him whilst he was on the vessel, I noticed at once, with the evacuation of the gas, a change for the better. The face, that had been pinched and drawn, as is common in acute intestinal suffering, now resumed its natural appearance, and a sense of comfort thereon began to manifest itself. He had a fecal evacuation. The patient was now greatly relieved; he lay down and rested quietly. In twenty minutes I repeated the injection, and another fecal evacuation followed. The patient was now calm, and soon thereafter fell asleep. Although the obstruction was relieved and the flatus evacuated, the patient still felt great soreness in this region, and the general manifestations led me to believe in an incipient inflammation. However, under the use of opium combined with small doses of blue mass, and occasionally doses of castor oil, these manifestations disappeared, and in ten days the patient was out.

I am satisfied that, if relief had not been so promptly afforded in this case, a very dangerous and violent inflammation would have rapidly supervened, and the patient would have succumbed.

As recited in the histories of the cases here recorded, I supplemented the powerful action of the force-pump by using water either cold, at a temperature of about  $65^{\circ}$  to  $70^{\circ}$  F., or hot, from  $100^{\circ}$  to  $106^{\circ}$  F. In Case I., a young boy of phlegmatic habit, with no symptoms of inflam-

mation, with very little pain, with a decidedly lethargic condition of the general system, I used cold water. In Case II., an old man of over seventy, and very much debilitated by suffering and inability to take food; and in Case III., also a man past his prime, of nervous temperament, and very susceptible to suffering, there was the probability of an acute congestive or inflammatory condition being present, and I used hot water—more agreeable to the sensations of the patient, and less liable to produce severe shock. By this method, besides obtaining rapid relief for the patient, there was also gained the beneficial effect of the hot or cold water upon the walls of the intestines. It is superior to the opium treatment, in that it cures the patient and thereby relieves him promptly of his suffering, whilst opium frequently fails to accomplish the sole purpose of its administration—the relief of pain. This is well demonstrated by Cases II. and III.

The superiority of the plan of treatment by the force-pump, supplemented by the use of water, either hot or cold, has been clearly demonstrated by the cases here recorded. It possesses, moreover, another advantage over all other plans of treatment and one that is certainly of the greatest importance both to patient and physician, namely, that it differentiates clearly and distinctly whether a given case requires a surgical operation or not.

I believe that if after careful trial of the force-pump we fail to relieve our patient, we may rest assured that *nothing but a surgical operation* can cure him. This indication will be given early, and no time need be wasted with futile tentatives, and the chances of success for such operation will be increased a hundredfold from what they are to-day, when operations are usually resorted to after everything else has proved inefficient, after much precious time has been consumed and the patient is almost moribund.<sup>1</sup> This belief is confirmed by the following clinical experience.

CASE IV.—August 29, 1884, I was called to see a young girl aged thirteen. She was of excellent development, rather tall for her age, and very bright. She had just returned a few days ago from the country, where she had been spending her vacation with relatives. Her mother told me she had a severe diarrhœa, having gone to the water-closet about fifteen times. I asked my patient, and she confirmed the statement. She had no fever. Her tongue was slightly coated. Her belly was somewhat tender to the touch; not markedly tympanitic. Her mother stated that she had been eating a great deal of fruit. I prescribed a mixture of bismuth with aromatic syrup of rhubarb to be taken internally, and iodine with aconite to be painted over the abdomen, and placed the girl on a bread and milk diet.

Sunday the 31st, I was again called to see the girl. The pain had

<sup>1</sup> Since writing this article I find that Mr. F. Treves, in an address before the British Medical Association, has expressed himself in a manner coinciding with the views of the writer as stated in the article in the Medical Record, December 30, 1882, as to the necessity of operating early in these cases. See Medical Record, August 15, 1885.



not abated and she was still suffering with diarrhœa. Inquiring as to the effect of the first remedy, I learned that she had felt better and that on Saturday she had dressed and gone out with some girls of her own age to make some visits, and at the house of a friend she had eaten a couple of large pickles. Her mother believed that in consequence of this indiscretion her diarrhœa had begun again. For some reason or other, I had doubts as to the correctness of this statement, and, therefore, directed her not to let her daughter go to the water-closet any more, but when she felt that her bowels were going to be moved, to let her go upon a vessel, and to be sure to examine the stools. For the present I prescribed nothing. Upon my visit Monday morning the mother told a different tale. The girl had gotten up about every twenty minutes, but there was no stool. She would sit for awhile upon the vessel and always seemed loath to get up from it, and had some tenesmus. I now began to suspect some grave trouble. I wanted to give her an injection, but they had no syringe. I returned in the evening bringing my pump with me, and proceeded to give her a large injection of water, temperature about 100° F. The water passed from her without bringing any fecal matter. As she was very restless and experienced some pain, I directed a few small doses of morphia to be administered during the night. It was now plain to me that I had to deal with a case of intestinal obstruction, but of what character I could not tell. There was nothing in the external appearance of the abdomen to give any indication, and the tenderness and pain were generalized over the whole region. Next day on my visit, I found the patient had rested somewhat during the night, but there was some elevation of temperature, the thermometer in the axilla showing 100°; complete anorexia, and considerable thirst. She retched a good deal. The abdomen was more tense, but it seemed to me not quite so tender. I repeated the injections, but with no better result than the evening before. I then requested that a consultation be called. It was now for the first time that, realizing the seriousness of the case, the mother gave me a full history. It was as follows: The girl, whilst on her visit happened to be playing with some girls when they came across a heavy piece of iron lying on the ground; wagers were made as to who could and who could not lift it from its place. My patient lifted it, but from that time she walked with a marked stoop and could not straighten herself when asked to do so. The friends in the country with whom she was staying gave her pills and other forms of purgatives. Seeing, after ten days, that she still stooped, they sent her home, a distance of 150 miles, which she travelled by boat. On her arrival she did not complain much, ate as usual, went out and paid visits, and seemed well with the exception of this bending over. Her mother after a few days took her to the Dispensary of the Ohio Medical College to have something done for her back. There she was told that nothing could be done for the present, but that she should return at some future day. During this time the girl was going constantly to the water-closet and had movements of her bowels once or twice a day.

This history certainly rendered the aspect of the case more serious, as nearly a month's precious time had been lost.

Prof. C. G. Comegys, M.D., was called in consultation and saw the case with me in the evening. He confirmed the diagnosis and agreed with me in the treatment. It remained fruitless. I was now convinced that nothing but an operation would relieve the case, and accordingly



requested Dr. T. A. Reamy to see the patient. He saw her Wednesday afternoon. Her condition was now very grave indeed. There were marked febrile movement, great thirst, frequent vomiting, and great prostration. There was also a constant desire to go to stool, and every little while she would get on the vessel and would sit and sit, and was with difficulty put back to bed. I urged the necessity of the operation as the only measure promising success and capable of averting a fatal ending. Prof. Reamy agreed with me as to the advisability of the proposed measure, but her parents would not consent. With that obstinacy born of ignorance and stupidity they would not listen to any argument—"if the child was to die, she might as well do so without an operation." And Friday night she died, more, it seemed to me, from exhaustion, than from the disease itself.

I was desirous of making a post-mortem examination, to discover first the pathological condition, and, secondly, whether an operation would have been beneficial or not. With considerable difficulty I obtained the parent's consent thereto, upon pledging my word that nothing but the abdomen should be opened, that nothing should be removed, and by permitting two laymen to be present. Accordingly, Saturday evening, the post-mortem was made; there were present, Prof. Reamy, myself, and Dr. Jos. Eichberg, pathologist to the Cincinnati Hospital, who kindly volunteered to do the work. Upon opening the abdomen a great quantity of fluid, almost like a dropsical effusion, escaped. The peritoneum presented evidence of very recent inflammation. The intestines were now carefully examined; there were no inflammatory bands around them. A knuckle of the ileum was found passed through a slit in the omentum and bent upon itself. The intestinal structures about the region of the incarcerated portion were somewhat softened. In some portions of the small intestine there were noticed small holes, as if made by a punch; from the lack of any evidence of severe inflammation in the surrounding structure and in the immediate neighborhood, and from the generally healthy appearance of the intestines, I was led to the belief that these were post-mortem occurrences; if not, they might have happened in the last thirty-six hours when the vitality was already very low.

It is apparent that the opinion held as to the form of obstruction, an opinion derived from a failure of the force-pump to relieve, was correct.

Secondly, it is clearly evident that an operation would have certainly cured the case,—a slight snipping of the omentum being all that was required.

Though the cases be few in number, still, from the rapid and brilliant manner in which Cases I., II., and III. were cured, the certainty with which the diagnosis was made in Case IV. and verified by post-mortem examination, the following conclusions can be justly drawn therefrom:

1st. Enemata are superior to every other method of treatment.

a. In the rapidity with which the cases are relieved.

b. And in clearly indicating whether a surgical operation will be required.

2d. They are entirely safe and free from all danger, and in no way prejudice the case should a surgical operation become necessary.

## REVIEWS.

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### GENERAL ANÆSTHESIA AND ANÆSTHETICS.

THE PRACTICE OF ARTIFICIAL ANÆSTHETICS. By DUDLEY W. BUXTON, M.D., B.S., M.R.C.P., Administrator of Anæsthetics at University College Hospital.

ON ANÆSTHESIA. By R. MILNE MURRAY, M.B.

ON ANÆSTHETICS. By JOHN CHIENE, F.R.C.S. Ed., F.R.S.E., Professor of Surgery in the University of Edinburgh.

THESE are the titles of a series of papers read before the British Medical Association at its last meeting, and published in the *British Medical Journal* for Sept. 19, 1885. Such a series of papers upon anæsthetics written by men selected, as especially fitted for the purpose, by a society so high in standing and so fruitful in good works as the British Medical Association, cannot but attract the attention and excite the interest of every one. Such papers deserve careful examination. From them may be learned what, at the present time, can be accepted as settled in regard to anæsthetics; what, if any, recent advances have been made; what points yet remain upon which opinion is divided. From them our readers will be enabled to compare the theory and the practice of surgical anæsthetics here, with those of their professional brethren of another country, of one which has done so much, in so many ways, to advance the knowledge and promote the use of anæsthetic agents.

These papers are not, of course, elaborate or exhaustive, no one of them extending beyond a length for comfortable reading at a single sitting. The one by Dr. Buxton is largely, and that by Dr. Murray entirely, devoted to the physiological aspects of the subject, while that by Mr. Chiene, and the debate, which is brief, tend largely toward the more practical points. All of them bear evidence of thorough acquaintance with the subject, all show care and study in the preparation and an evident effort to bring the subject up to the latest time. One notable exception, however, must be made to the last clause of this general statement. The paper by Mr. Chiene is stated to be a reprint of a lecture delivered by him to his class in 1876. Now whether it is just the proper thing to present to such an Association, upon a subject so important as this, matter ten years old, is for others to determine. This much, however, is very certain: if the profession has not advanced as to anæsthetics within the last decade beyond Mr. Chiene's paper, or farther than is indicated in the few added passages placed in brackets, then there is much to deplore. Further, it may be said, that the man who can say that he has "nothing to retract and very little to add" as to his knowledge of the

subject as it was ten years ago, is strangely oblivious to what has gone on around him.

The first conclusion arrived at from perusal of these papers is, that there are some points concerning anæsthetics which seem to be settled. These may be first disposed of. Thus, we find no mention of "idiosyncrasy" as an explanation of death under these agents. It has figured all through the history of the subject, but with gradually decreasing importance. It was a bugbear which should have been banished after even the first few deaths had occurred to persons who had taken the anæsthetic before, because idiosyncrasies do not change from day to day. It seems now to have disappeared; let us hope that it be forever.

Etherization by the rectum finds here no assistance toward professional favor. It receives but scant mention, no praise, and full recognition of its dangers.

The conclusion seems to be, that the agents which are now in daily use are the best known. No new anæsthetic is brought forward and the use of none but the standard ones advocated. Methylenes is again stated to be nothing more than diluted chloroform. Methylenes dichloride is "a substance very difficult to prepare and very costly," while amylene and ethidene have a bad record as to safety. Effort, is therefore, to be directed to a better knowledge of the action of those we now have, rather than to "a superficial, if showy, acquaintance with the plethora of agents which already glut the anæsthetist's armamentarium." No one who reflects upon the immense experience we have had with ether and chloroform, can fail to assent to this. A vast length of time must elapse before we could possibly acquire an equal amount of experience with other agents, and when we consider the low rate of mortality from the agents we now have, we can see how much longer would be the time before we could be sure that others are safer. Possibly chemistry may make some brilliant discovery of a general anæsthetic which, like cocaine, will abolish pain without affecting consciousness, but the probabilities are, that the anæsthetics now in use will not be displaced.

Discussion seems to have ceased as to the mode of action of anæsthetics. Dr. Buxton alone takes up the subject at length, and considers the theories that they produce their effect: 1, by lessening oxidation of the tissues; 2, by causing changes in the blood akin to carbonic acid poisoning; 3, by causing anæmia of the brain. None of these is tenable, and he falls back upon the only possible explanation—some change in the minute structure or processes of the nervous system.

"We, therefore, have to fall back upon one hypothesis which formulates that the action of this group [the carbon compounds] of anæsthetics is one exerted upon the nervous system itself. To this view a rider will have to be appended, to the effect that this action is one which falls upon the protoplasm of the nervous and of the muscular systems."

All other theories of the action of anæsthetics were disposed of, and this same conclusion arrived at, by Claude Bernard,<sup>1</sup> more than ten years ago. Although this author is quoted by Dr. Buxton, nothing is said as to his explanation of the nature of the action, which was that it "is a semi-coagulation of the intimate constituents of the nervous cells," a theory which does not break down before the fact that the move-

<sup>1</sup> Leçons sur les Anæsthesiques, etc., Paris, 1875.



ments of the sensitive plant, where no nervous system exists, can be arrested by chloroform. Leave out the word "nervous," and the application holds good. However, knowledge as to the particular change, whatever it may be, is of no practical importance.

We find in these papers a general expression of the opinion that all anæsthetics are dangerous. There is no dissenting voice. Dr. Buxton says:

"In summing up the case of various members of the carbon series in which chlorine occurs, I think we must admit that, as far as the evidence is now before us, they are all dangerous anæsthetics."

Mr. Chiene says: "I am of opinion that no form of anæsthesia is safe, and to aim at obtaining an absolutely safe anæsthetic is to follow a shadow." Mr. Gunn, in the debate, says: "A perfectly safe anæsthetic had not been found, nor was it likely ever to be obtained." This may seem a small matter to comment upon, and so it is when the physiology of profound anæsthesia is alone considered, but it is far from being so in view of the partisanship which has prevailed, and which is still sometimes indulged in, as to particular anæsthetics. There is no agent used which merits the distinction of being the *only* safe anæsthetic. Let those who have claimed this for ether make a note. Moreover, there is a practical bearing of the fact well put by Mr. Chiene: "There is danger in lauding any anæsthetic as safe; it will certainly make the average administrator careless."

The next and very important observation is that the great danger of partial anæsthesia seems at last to have received due recognition. It is admitted by nearly all, and it is stated by one, who is not far from the truth, to be "the worst thing possible." Clearness of understanding of the mode of death, when it follows the surgeon's first incision under partial anæsthesia, is not promoted by saying that the death is by "shock," or by "syncope." Nevertheless, an appreciation of the great clinical fact and its practical value, is of the first importance. Looking back over the history of anæsthesia, it is astonishing to see how slow the profession has been in giving general acceptance to so important a point. Worked out experimentally by Lallemand and Perrin,<sup>1</sup> recognized and impressed by Richardson,<sup>2</sup> presented to and urged upon the profession of this country by the writer as early as 1867,<sup>3</sup> it has never until now assumed the prominence it deserves. Yet clinical experience has, unfortunately, given but too many illustrative examples. Over and over again death has followed instantly upon extraction of a tooth. Forty per cent. of deaths have taken place when the anæsthetic was given for a minor operation. A large proportion of these find their explanation only in this way. Now that this reflex mode of death is recognized in standard works on *materia medica*,<sup>4</sup> there will be no further question as to it. Dr. Brunton, however, explains the fact that imperfect anæsthesia is so dangerous, by saying that "chloroform does not paralyze all the reflexes at the same time." Claude Bernard says that in the early stages of chloroform administration the reflex actions are *increased*. We do not consider it yet established that under ether this mode of death is equally likely to

<sup>1</sup> *Traité d'Anæsthesie Chirurgicale*, Paris, 1863

<sup>2</sup> *Med. Times and Gaz.*, 1870.

<sup>3</sup> *This Journal*, January and October of that year.

<sup>4</sup> Brunton's *Pharmacology*, Phila., 1885.



occur. Still, caution is the best safeguard. The ultimate action of all anæsthetics is probably the same. In the language of Bernard, there are many anæsthetics, but only one anæsthesia.

We unhesitatingly accord to Dr. Murray the credit of furnishing the most considerable and the best addition to our knowledge of the subject of anæsthesia to be found in these papers. Engaged in a series of experiments on the action of the uterus in rabbits, some modifications of respiration under chloroform forced themselves upon his attention. He observed that the movements of respiration may continue normal as to rhythm and depth, and yet no air enter or leave the chest. The chloroform was administered through a tube introduced into the trachea and the air-current registered by a recorder. The failure of the recorder to move was observed in five different cases, and the cessation extended in one case to twenty-eight seconds. All points of deception having been investigated, the conclusion given above was forced. Dr. Murray's explanation of this occurrence is that it arises from a failure of coördination of the muscles of respiration; that their rhythmic action is disturbed, as is the faculty of speech by the influence of alcohol, producing what may be termed a "respiratory stammer."

"Thus it might come about through the action of the anæsthetic on the centre of respiration, that the action of the diaphragm might be antagonized by the muscles of respiration, and *vice versa*."

Dr. Murray further observed that when the recorder ceased to register an air-current, if a sudden afferent impulse were given, as by pinching the eyelids, it immediately recommenced work, showing that normal respiration was resumed. This brings us to the practical application which he makes. Sudden cessation of respiration in the human subject is generally explained by supposing that the tongue falls back on the glottis, obstructing the passage, and by pulling the tongue forward the patient is saved. This is doubted. The position is taken, with diffidence, that in many of these cases the falling backward of the tongue had nothing to do with the cessation of respiration, which, instead of depending on local causes was central, instead of being mechanical was vital. The relief which follows pulling forward the tongue depends then, in some cases at least, upon a reflex influence exerted upon the respiratory centre, similar to that which pinching the eyelids effects, and not upon mechanically opening the glottis. Now it is curious to note that Dr. Murray does not mention any authority in connection with this theory of restoration, he seems to have reached it directly from observation of his own experiments. But Lister<sup>1</sup> taught this doctrine fully and clearly; he both called in question the falling back of the tongue, and maintained the reflex influence exerted by pulling it forward. Mr. Chiene, in his paper, agrees with Dr. Murray. He says that he is inclined now to lay greater stress upon the reflex influence of pulling out the tongue than he formerly did, although he does not entirely abandon the mechanical theory. Finally, the theory of this reflex influence finds strong confirmatory support from the progressive march of chloroform anæsthesia. The mucous membrane of the throat and larynx is the last refuge of departing sensibility.<sup>2</sup> Based upon this fact, even before 1863, Jules Guérin advocated cauterization of the pharynx as a means of combating the accidents of anæsthesia.

<sup>1</sup> Holmes's System of Surgery, art. Chloroform.

<sup>2</sup> Lallemand et Perrin, op. cit.

All that Dr. Murray has written here upon the resuscitation of animals when respiration has ceased, should be read. It is highly interesting, and there is a further practical application. He is undoubtedly right in the assumption that the effect of the first inspirations made is to carry more chloroform into the blood and thus seal the fate of the patient; and that, therefore, the first effort should be to withdraw from the air-passages the air saturated with vapor. While it is entirely impracticable to follow out his suggestion, to carry a tube, which, in case of accident, is to be passed into the glottis, we think his teaching worthy of being kept constantly in mind by every administrator. He should satisfy himself that air passes in and out of the chest, as well as that the respiratory muscles move, and that in efforts to restore the patient when in danger, expiration should precede inspiration. We may add, too, that the administrator of chloroform should never fail to hold in mind the residual air of the respiratory process.

The mode of death from anæsthetics equals, if it does not transcend, in interest and importance, any other point connected with the subject. We are glad to find here a general recognition of the fact, that there is more than one way by which these agents prove fatal. No one thing, in our opinion, has retarded progress so much as want of recognition of this fact. There have been two great errors in the past as to this point: first, an obstinate adhesion to some particular mode of death; second, a too rigid application of the results produced in animals to man. They have not yet entirely disappeared, for there are traces of them even here. Thus, Dr. Murray says "chloroform is primarily a respiratory poison, and if given in sufficient quantity it stops the action of the respiratory centre before it affects the heart." The proposition is true if limited to animals, but it can be broken down in a moment by clinical evidence. If this were matter of theory alone it would not merit attention, but theories in regard to the mode of death have direct practical bearings of the utmost consequence. From theories have been derived those sententious expressions which have influenced practice, as do all dogmatic expressions, and influenced it for evil. "Give a dose of spirits before administration and your patient is safe." "Never mind the pulse—watch only the respiration," etc. The long continuance of error upon this point can only be explained by the facts, that it has been given to no one man to see and compare many deaths, and that there have never been spread before the profession the collected deaths so that they could be studied and compared. In this country the deaths were classified as early as 1867,<sup>1</sup> and an attempt made to impress upon the profession the importance of recognition of the fact that they differ widely in character. Nothing can be more striking to any one who will carefully study anæsthetic deaths, than the different period of the process at which, and the different manner in which, the subjects died.

Dr. Buxton's paper is the fullest upon this point. He recognizes reflex death by chloroform of two forms. The first is when the impression comes from the surgeon's knife in a state of partial anæsthesia, which has been already considered. In the second the impression is upon the terminal branches of the vagi in the lungs, or upon the laryngeal nerves, reflected upon the heart and suddenly inhibiting its action. This doctrine was first taught by Dr. Bigelow, of Boston, as early as

<sup>1</sup> This Journal, October No.

1848,<sup>1</sup> then by Brown-Séquard in his lectures on the physiology of the central nervous system, and has been repeatedly urged upon the profession in this country since. It is sustained by the experimental observations of Rutherford,<sup>2</sup> upon the effect of irritating vapor, as ammonia, applied to the nose of anæsthetized animals, and especially by the observations of the Anæsthetic Committee of the British Association<sup>3</sup> as to the sudden and very considerable diminution of the blood-pressure upon every application of a fresh supply of chloroform to the sponge. Recognition of this mode of death is of the first practical importance as to administration. Case after case in the clinical records can be pointed out, in which death followed instantly upon pouring out a new supply of the liquid, or upon the patient drawing a deep inspiration.

As there are two forms of reflex death, so there are two forms of direct death—*i. e.*, death produced by direct action of the agent on the nervous centre of either the respiratory or the circulatory systems. Illustrations of both these can be found in any collection of deaths; sometimes respiration has ceased first, sometimes cardiac action stopped suddenly while the breathing continued for a time. Both these forms are recognized by Dr. Murray.

Besides these modes of death, together with that from obstructed respiration, either by spasm of the glottis, falling back of the tongue, or incoördination of the respiratory muscles, as already considered, Dr. Buxton is inclined to accept another, caused by direct action of chloroform upon the muscular structure of the heart. The question of this mode of death was considered by Koch,<sup>4</sup> by Kappeler,<sup>5</sup> and by Richardson. All have decided in favor of the view that the influence is exerted rather upon the cardiac ganglia than upon the muscular structure. It would seem impossible to say what particular tissue is affected when chloroform is blown on the heart of an animal and its action thereby restrained or stopped. All analogy, together with the marked preference, or elective affinity, of chloroform for the nervous system, would seem to sustain the opinion of these authorities. Dr. Buxton, however, thinks the effect is exerted upon the protoplasm:

“Chloroform is certainly inimical to protoplasm at the least in a higher degree than is ether.” “There seems to me no doubt at all that chloroform is a powerful protoplasm poison, and as such its use must be fraught with danger.”

As to modes of death from ether, Dr. Buxton recognizes, first, that from spasm of the glottis, “so rare as to be practically unimportant, save as a means of pointing a moral.” Second, that by causing bronchitis, pneumonia, etc. “That there is a considerable danger of these occurrences in the case of young and delicate children, I am pretty certain.” It is the aged, we believe, who are peculiarly liable to a rapidly fatal suffocative catarrh after ether, although full references cannot now be given.<sup>6</sup> Mr. Chiene mentions a death the day after the operation from severe bronchial symptoms, and in his opinion due to the ether, but he does not give the age of the patient. In the debate one speaker recognizes this danger. Then comes death by paralysis of the respiratory centre, and claimed by those who carry their advocacy of ether to par-

<sup>1</sup> Transac. Amer. Med. Assoc., Vol. I.

<sup>2</sup> British Med. Journ., 1879.

<sup>3</sup> Anæsthetica. Lief. xx, der Deutschen Chirurgie, Stuttgart, 1880.

<sup>4</sup> Journ. of Anat. and Phys., May, 1869.

<sup>5</sup> Klinische Vorträge, No. 80.

<sup>6</sup> Richet, Accidents tardifs apres l'administration d'anæsthesiques, Gaz. des Hôpitaux, July, 1879.



tisanship, to be the only mode of death from this agent. Dr. Buxton admits another, the same mode as that in which chloroform frequently proves fatal, a death by paralysis of the circulatory centre, for so we interpret the term "syncope." This form, he says, is rare, much rarer than with chloroform, which is certainly true. But it is very singular to see that Dr. Buxton having admitted this form of death, hastens to throw doubt on it! "It is probably doubtful whether these cases are due to ether-inhalation; as we shall see, the heart is practically uninfluenced for evil by ether." True, if there be added "*in animals*," but it is not true in man. Dr. Buxton says: "The action of ether upon the vasomotor system has been carefully worked out. Arterial pressure is always increased in ether-narcosis." But Kappeler says the reverse, and his observations were made upon man. In seven of ten sphygmographic tracings, "the curve of deep ether-narcosis differed not at all from that of chloroform-narcosis,"<sup>1</sup> and his conclusion from clinical study was that death in man under ether does not always begin with the respiratory process, and that ether-death does not differ essentially, in some cases, from chloroform-death. Ether-death by cardiac paralysis is distinctly recognized by Mr. Clover,<sup>2</sup> an authority which will certainly be accepted anywhere. This form of death is the exception, it is true, with ether, while it is frequent with chloroform.

There remains now to note some points not mentioned at all, or which do not receive the attention they deserve, even in papers not designed to be exhaustive. There is no observation or remark as to those fatal cases in which the dangerous symptoms make their appearance some considerable time after the administration of the anæsthetic has ceased. Such cases there are on record, after both ether and chloroform; and with our present knowledge they baffle all attempts at explanation, and offer an interesting and complex problem for solution.

There is not the slightest allusion here, in papers or debate, to the important fact, first recognized by Dr. Emmet, that a patient with albuminuria is a peculiarly bad subject for ether. The point is one of so great practical importance that it is singular not to find it in a canvass of the dangers of anæsthetics.

We looked with interest for, and think there was right to expect, something here as to the relative use of the two great anæsthetic agents, and as to their relative mortality in Great Britain. Some inference may be drawn, but there is no definite statement, and no statistics. Any one who reads a weekly British medical journal, cannot fail to be horrified by the frequently recurring announcement of a death from chloroform, nor to feel the deepest surprise that the profession there has not to a greater extent abandoned an agent which experiment and experience have both demonstrated to be far more dangerous than other anæsthetics at command. And still these papers and this debate show no marked disposition to change. The general tone is that ether is the safer anæsthetic. One would think that Dr. Buxton had made the dangers of chloroform pretty plain, yet in the very same paragraph in which he says that its use "is fraught with danger," he himself expresses the belief that it "is much maligned," which means, we suppose, that a good case has not been made out against it! Further, "as a practical anæsthetist myself, I should not hesitate in many conditions to administer

<sup>1</sup> Op. cit., pp. 158, 167.

<sup>2</sup> Quain's Dictionary, art. Anæsthetics.



chloroform, or a congener, rather than ether." The determining conditions he does not give. In the debate, we read that "all Scotch surgeons like chloroform, and it is the same among Scotchmen in London." Mr. Chiene is a Scotchman. After a death from chloroform in his wards he used ether for a year, and then returned to chloroform. Now he makes a bold plea for his agent. He says:

"The present outcry against chloroform is the result of an imperfect understanding of A, its physiological action; B, the proper method of administration; C, the dangers which may accompany its use, and their treatment; D, the dangers which follows its abuse, and their treatment."

If any one could transport himself back to the time Mr. Chiene's lecture was written, he might accept the professional feeling against chloroform as a mere "outcry;" with eyes open in the present, it is impossible not to see that our understanding of most of these points is far from imperfect. Prof. Fraser, in the debate, boldly stated his disbelief of "the difference alleged to exist in the relative mortality of chloroform and ether." And "nothing he had ever heard would lead him to believe that ether was distinctly preferable to chloroform." Prof. Fraser is an eminent teacher of *materia medica*, and lives in Edinburgh. With statistics now before the profession his position is astounding, but we can appreciate the point he makes that the use of ether, "only now commencing to extend" in Great Britain, the near future may show a different footing of the figures. It is precisely in the lack of statistics upon this point that the greatest disappointment is experienced in reading these papers. For some years ether has been gaining upon chloroform as an anæsthetic in that country, and it is there that a solution of the problem of the relative mortality of the two great anæsthetic agents is to be looked for. Here Kappeler looked for it. In his work published six years ago, he pays a handsome tribute to the public institutions of Great Britain, to the publicity of their administration, to the enterprise and conscientiousness of its medical press, calls attention to the vast field there presented for observations of anæsthetics, indicates that to that country we must look for a solution of this yet unsolved problem. The solution has not yet been furnished.

Finally, as to the relative danger of the two agents, ether and chloroform, we fail to find here a recognition of that one great point which should alone decide the question. That point is the irregularity of action of chloroform—the fact that it does not always act in the same subject in the same manner. To show that this is a fact we could quote abundant testimony, both practical and theoretical, but there is enough emanating from Great Britain alone. Clover recognized the irregularity of action of this anæsthetic and abandoned it. Anstie indicated it. Richardson says that chloroform shows "deviations of the usual order in which the various functions of the nervous system are affected." But nowhere is this point more prominently stated than in the report of the Anæsthetic Committee of the British Medical Association, and published in its own journal.<sup>1</sup> Chloroform acts so differently upon the same animal at different times, that this Committee is obliged to strain language and use a word which implies volition to express it—"chloroform has sometimes an unexpected and capricious effect on the action of the heart!"

It is this fact that has justly banished chloroform from general use as an anæsthetic; by this fact alone can it be explained that chloroform has caused death under all circumstances, in spite of the most minute precautions, and in the hands of the most skilful administrators, such as Snow, and Clover, and Kappeler. Yet this fact seems yet unrecognized by the profession of our sister country.

With hesitation to accept ether, and a recognition of the dangers of chloroform, we find no effort to escape the dilemma by resorting to mixtures. They receive very little mention. One speaker alone has lately used the A. C. E. mixture—one part alcohol, two parts chloroform, three parts ether, by measure. All he can say of it, is that he has found it “a very useful preparation.” Another gravely asks what is the object of the mixture, and another says that all the ether will evaporate and leave only chloroform “*in a week!*” Doubtless he has been misreported. Mr. Baily, of London, is in the habit of giving four parts of ether to one of chloroform “in eye cases, and this did very well, too, in cases of ovariotomy and general surgery.” But one surgeon has used mixed vapors systematically, and that has been by Clover’s inhaler, giving first chloroform, and then turning on ether. Again we have to confess surprise. Mixtures were formally recommended by the Medico-Chirurgical Society of London as early as 1864; among the formulæ given was that of the A. C. E. mixture. Yet in the land of their birth they are scarcely recognized. It is impossible to frame an explanation. Mixtures are diluted chloroform. All experiments with animals have shown the importance of keeping down the percentage of chloroform vapor in the air, all inhalers have been designed to insure this, and we add that an immense clinical experience has been gathered in favor of simple dilution. There is the Vienna mixture, six parts of ether to two of chloroform, with more than 8000 administrations and no death; there is the weight of Billroth’s authority in favor of three parts chloroform, one part ether, and one of alcohol; there is the valuable experience of Sir Spencer Wells, in favor of methylene, which is only diluted chloroform. Twenty years’ experience with the A. C. E. mixture has given to the writer the firm assurance that this mixture is equally as safe as ether, while it is far more prompt in action and manageable during administration.

From these papers it appears that there has not been in Great Britain any considerable experience with, and consequently that there is no just appreciation of the value of, the combined influence of morphia and atropia, in modifying the action of anæsthetics, and in warding off their dangers. The practice of giving a preceding hypodermic injection of these narcotics is resorted to by few, its advantages are questioned by some, and but faint praise is given it by any. One speaker deems it “advisable” where shock is anticipated, or where the condition of the patient demands it—the particular condition not being stated. Another thought that “the administration of morphia undoubtedly possessed some advantages, as in avoiding shock; but the resulting narcosis was often very prolonged, and might cause alarm,” which may be true, but depends entirely on the amount of the dose. Prof. Fraser “raised the question as to whether the administration of morphia and atropia beforehand was really of practical value.” Mr. Chiene alone follows this plan regularly, and has done so ever since he resumed the use of chloroform. He, however, expresses no strong convictions in its favor. We trust that the history of this important modification of the anæsthetic process is better

known in Europe than is indicated here. Mr. Chiene's "attention was directed to it by his house surgeon," and, "he learned it from Prof. Fraser's lecture." Surely Nussbaum and Bernard, who, in 1863, almost simultaneously discovered it, deserved mention, and especially the latter, who, in 1875,<sup>1</sup> gave to the world the experimental proof of the benefits to be derived from it. Just across the channel, theses and treatises have appeared upon the subject,<sup>2</sup> and ten years ago it was formally advocated in America.<sup>3</sup>

When we examine this mode of practice theoretically, we cannot but be astonished at the amount of favorable evidence which immediately presents itself. Anæsthetics produce death in various ways, the most frequent of which is by depression of the circulatory or respiratory powers; one or both of these fail more or less suddenly. Chloroform frequently causes death by a profound impression on the laryngeal and pulmonary, or on sensitive nerves, thus by reflex action, inhibiting the heart. Could we eliminate from the action of chloroform depression of the heart's action, and deleterious reflex influence, it would stand to-day without a rival as an anæsthetic. The only question remaining then is, whether we have any drugs which will stimulate and sustain cardiac and respiratory power and restrain reflex action. The question needs no answer. It is in every treatise on *materia medica*. The power of atropia as a stimulator of the two great vital functions has been emphasized by Harley, and Bartholow, and Fothergill, while the soothing and shielding influence of morphia against all irritations needs no mention. And now comes Lauder Brunton to add abundant testimony of the strongest character in support of this modification of the anæsthetic process.<sup>4</sup>

It is curious to see Dr. Buxton come right up to a recognition of the necessity of something of this kind and then pass on without mentioning it. He asks "if we may not so administer our chloroform as to obviate all possible risk of reflex syncope through stimulation of the vagal endings," and gives no answer to the question.

When it comes to clinical support, there is a great deal in favor of this mixed anæsthesia, besides that given in the authorities mentioned, and we know of none adverse. Personal experience with it has been extensive enough and varied enough to impress the strongest convictions. Nor is it in a single direction that benefit is derived. First, there is the emotional disturbance quieted, and there have undoubtedly been deaths purely emotional from dread of the anæsthetic, just as there were such deaths from dread of the operation before anæsthetics were known. Then there is the small quantity of anæsthetic required to produce and to maintain surgical anæsthesia. Again, there is the greater quietude of the patient from the more profound effect. Bernard could tie the lingual artery of the dog, deep in the throat, under the united effects of chloroform and narcotics, but could not do it with either alone. We have seen the method tried with the same anæsthetic (A. C. E.), by the same administrator, to the same patient, and for the same operation, and

<sup>1</sup> *Leçons sur les Anesthésiques*, Paris.

<sup>2</sup> *De l'anesthésie mixte*, etc. Par Verriest-Litardière, Paris, 1878. *Recherches sur l'anesthésie chirurgicale obtenue par l'action combinée de la morphine et du chloroforme*. Par H. de Brinon, Paris, 1878.

<sup>3</sup> *This Journal*, April, 1876.

<sup>4</sup> *Pharmacology*, Phila., 1885.

"Belladonna and stramonium have a rather peculiar action, stimulating the respiratory centre, and at the same time appearing to lessen the excitability of the ends of the vagi in the lungs"—p. 223

"This drug [atropia] completely destroys the inhibitory action of the vagus on the heart"—p. 252.

"These two classes [among them is atropia] agree in destroying the inhibitory power of the vagus nerve."



have been both surprised and pleased at the contrast. Over and over again we have seen patients go through ovariectomy without pulse or respiration wavering, and Richardson pointed out the marked reflex effect of thrusting a sponge into the peritoneal cavity. Over and over again we have seen them pass through this operation without moving a muscle or uttering a sound. We have seen them strapped down to the table in England. Then after the operation with this plan, hours are spent in quiet slumber and the after-sickness of the anæsthesia is lessened, because, as a general rule, it is in direct proportion to the quantity of the anæsthetic absorbed. These advantages are all independent of the question of danger, and that none of them have attracted sufficient attention to cause notice is passing strange. Stranger still, and a more striking proof of the entire want of appreciation of this method in Great Britain, is the fact that it is not mentioned in the paper of Dr. Talfourd Jones, read at the same meeting, on Hypodermic Medication.<sup>1</sup> Formal consideration is given in this paper to the antagonism of medicines, and full recognition of the powers of morphia and atropia as cardiac and respiratory stimulants, and yet their effect in counteracting the depressing effect of chloroform on the heart is not mentioned.

In closing, we feel compelled to notice some points of doctrine to which we cannot give assent. They are all in Mr. Chiene's paper. This gentleman occupies a high position as a teacher, and enjoys an enviable reputation as a surgeon. Yet these facts but render the duty more imperative of combating doctrines which may mislead young practitioners and are fraught with danger to the patient. We will not oppose to any one of these mere theoretical disquisitions, but present the irrefragable evidence of clinical experience.

In his paper we read, in regard to the administration of chloroform, "No attention is to be paid to the pulse; it is the last thing that stops." In this he follows his predecessor, Lister, who did not hesitate to say that to consider the pulse the most important symptom "is a most serious mistake."<sup>2</sup> Now, in reply to this, it is not necessary to go beyond the first four cases of death, under chloroform, as given by Snow.<sup>3</sup> They were recognized as deaths by paralysis of the heart by Dr. Sibson, and commented on as such as early as 1848. "When the stoppage of the heart's action is due to the drug the patient is dead," says Mr. Chiene. This is true. But how about those cases seen over and over again where the heart's action failed and the patient was rescued? Dangerous symptoms, under anæsthetics, as well deserve study as cases of death. Of twenty-one cases of dangerous symptoms by Anstie, in sixteen a change in the pulse is most prominently noted, and, with pallor, was the first symptom observed.<sup>4</sup> In every work upon chloroform ever published, death beginning at the heart, has been made prominent under the various terms of "shock," "syncope," and "sideration," and clinical experience has furnished so many examples of this mode of death that it has been held by many to be typical of and peculiar to chloroform, and death by respiratory paralysis has been completely overshadowed. Yet we are told that it is a matter of no importance to watch the pulse!

Again, Mr. Chiene has some excellent remarks upon administration; that the administrator "must use his brains" is well put. But he says,

<sup>1</sup> British Med. Journ., Sept. 26, 1885.

<sup>3</sup> On Anæsthetics, London.

<sup>2</sup> Holmes's Surgery.

<sup>4</sup> Sanson, on Chloroform, pp. 87-89.



"it is a matter of no importance how much is poured on the towel, except as a matter of economy!" There is no more dangerous doctrine connected with the giving of chloroform than this. It is not necessary to go over again deaths from reflex action by powerful impressions on the laryngeal and bronchial nerves. Nor need we again refer to the report of the Grant Scientific Committee, and the observations of the sudden retardation of the heart's action upon every fresh application of chloroform to the sponge. But, clinically, what will Mr. Chiene do with Case II. of Snow's list? One such case is enough to settle the question; but of 133 fatal cases, 8 died immediately upon adding a new supply of chloroform to the sponge or apparatus!<sup>1</sup> The clinical evidence is overwhelming.

We read further of "stoppage of the respiration and heart's action, directly due to a poisoning *by an overdose of the drug.*" Again Mr. Chiene is true to the doctrines of the Edinburgh school, and continues an error which, in the expressive language of Kappeler,<sup>2</sup> runs like a scarlet thread through British anæsthetic literature. "Chloroform is a cumulative poison," Mr. Chiene says. How has it been shown? Of the fatal cases, fifty per cent. have died before the stage of surgical anæsthesia was reached.<sup>3</sup> In other words, when a patient is "off," under chloroform, one-half whatever danger there may be in the process is passed. Again, of Snow's fifty fatal cases, nine died within a minute after commencing to inhale, and four of these within a few seconds. These immense clinical facts must be disposed of by any one who maintains that chloroform is "cumulative," or kills only by overdose.

But there is another important aspect of this doctrine, a direct corollary of the premise. It throws the blame of every fatal accident most unjustly upon the administrator. This is plainly taught by Lister: chloroform "is deadly when mismanaged; is free from danger if properly used."<sup>4</sup> The proposition is monstrous. Deaths from maladministration there have been; they are easily recognized; but those who accept and maintain the proposition that all deaths are from "cumulative" effect, or overdose, and consequently from want of skill, or care in administration, must also accept the proposition that Simpson and Snow, and Clover and others, of the best administrators the world ever saw, killed their patients by malpractice.

The query will doubtless arise, how it is that, with so gross a violation of what we believe to be an essential point in the administration of chloroform—its slow and gradual introduction—the mortality does not illustrate it? To this may be adduced the very imperfect extent to which the experience of any individual can form a basis for the calculation of mortality. The figures seem "capricious!" Thus, Mr. Clover had 5000 cases without accident, and then two deaths close together. One hospital in England had one death in about five hundred administrations. Nussbaum has given it forty thousand times without a fatal result. Second, we find herein an additional argument in favor of mixed anæsthesia. Since Mr. Chiene has resumed chloroform, he precedes the administration by a hypodermic injection of morphia and atropia. It is the influence of these narcotics in sustaining the respiration and circulation, in benumbing reflex sensibility, in harmonizing actions of the

<sup>1</sup> See Lallemand and Perrin, Cases 11, 12, 16, 18, 26, 35, 40, 47, 66.

<sup>2</sup> Op. cit.

<sup>3</sup> Sansom.

<sup>4</sup> Holmes's Surgery.

nervous system thrown into discord as anæsthesia is produced, which enables the patient to pass safely through even the dangers of maladministration. And we do not feel at all certain that if the more extended use of ether should show any considerable increase of mortality, that the anæsthetic of the future will not be chloroform with a preliminary injection of narcotics.

J. C. R.

MICRO-CHEMISTRY OF POISONS, INCLUDING THEIR PHYSIOLOGICAL, PATHOLOGICAL, AND LEGAL RELATIONS; WITH AN APPENDIX ON THE DETECTION AND MICROSCOPIC DISCRIMINATION OF BLOOD. Adapted to the use of the Medical Jurist, Physician, and General Chemist. By THEODORE G. WORMLEY, M.D., Ph.D., LL.D., Professor of Chemistry and Toxicology in the Medical Department of the University of Pennsylvania. Second edition. 8vo. pp. 784. Philadelphia: J. B. Lippincott Company, 1885.

THE second edition of Professor Wormley's well-known treatise contains some valuable additions, but the scope and design remain unchanged. The most important of the additions, we are told in the preface, consist of illustrative cases, new tests and methods, and an appendix on the discrimination of blood. Numberless other improvements are, however, to be found in the text.

It may be said at once that the book is invaluable, and, indeed, absolutely essential to every toxicologist. It is no mere *rechauffé* of the labors of others, but is crowded with records of the personal work of the author, work which was much wanted, which required great patience as well as skill for its execution, and for which every scientific man must feel grateful. So great indeed is the value of the book, that the reviewer feels tempted to speak only of its merits and to ignore its defects. But it is necessary to say that it is very incomplete. It should have been smaller, or much larger, and in either case its practical utility would have been enhanced. The author might have confined himself to the subjects indicated by his title, and given us, with his admirable microscopic drawings, a complete account of the uses of the microscope in toxicology, and of limits of delicacy in chemical tests. Or, conferring a still greater boon, he might, as he evidently could, have made the book a complete manual of toxicology. As it is, the deficiencies are as obvious as its merits. Many poisons of great importance are omitted altogether, and many details with regard to other poisons which should appear in a complete treatise are absent. On the other hand, space might have been saved by the curtailment of purely chemical descriptions found in every text-book; as, for instance, in the pages devoted to the chemical properties of sulphuric acid and phosphorus. Among the omissions, we find poisons as important as the barium and chromium compounds, carbolic acid, nitro-benzene, chloral, colchicum, cantharides, ergot, savin, and croton, not to speak of the paraffins and terpenes. In regard to several of these poisons, Professor Wormley's careful observations would have been very useful.

The introductory section of the book deals, as usual, with definitions, classifications, sources of evidence, general methods, and the like. It

seems to present no particular points of novelty. The classification adopted into irritants, narcotics, and narcotico-irritants, is by no means perfect, but is perhaps as good as any other. An interesting case illustrating the effect of opium and quinine in delaying the action of strychnine is given on page 39. Although three grains of strychnine were taken, no serious effects followed for twelve hours, and death only occurred after forty hours. In this case one drachm of opium and an unknown quantity of quinine had been taken with the strychnine.

Part I. is devoted to inorganic poisons, the mineral acids and alkalies, oxalic acid, hydrocyanic acid, phosphorus, antimony, arsenic, mercury, lead, copper, and zinc. Throughout this part, and, indeed, throughout the book, the most remarkable and useful features are the careful determinations of the limits of delicacy of each test and the illustrative plates showing the appearance under the microscope of the most important precipitates. The system adopted in determining the limit of delicacy is illustrated in the first case that occurs, the action of platinic chloride on potassium chloride (weighed as oxide). In a series of experiments, single grains of water contained  $\frac{1}{50}$ th,  $\frac{1}{100}$ th,  $\frac{1}{250}$ th, and  $\frac{1}{500}$ th of a grain of  $K_2O$  as chloride, and each was treated with platinic chloride. Even in the last case a good precipitate formed in three-quarters of an hour. With barium chloride  $\frac{1}{40000}$ th of a grain of sulphuric acid, and with brucine  $\frac{1}{50000}$ th of a grain of nitric acid were detected, the test in the last case being made in a white porcelain dish. It is also recorded that  $\frac{1}{10000}$ th of a grain of oxalic acid gives satisfactory crystals, visible under the microscope, when evaporated on a slide.

The section on hydrocyanic acid is, on the whole, a good one, although its value is diminished by one or two serious omissions. Many interesting cases are recorded, of which not a few are from American sources. The comparative delicacy of the silver, iron, and sulphur tests, as applied both to solutions and to vapor, are compared with care. Solutions of the poison in one grain of water gave the following results, in fractions of a grain:

	In solution.	As vapor.
By silver was detected . . . .	$\frac{1}{500}$	$\frac{1}{100000}$
By iron was detected . . . .	$\frac{1}{100000}$	$\frac{1}{5000}$
By sulphur was detected . . . .	$\frac{1}{25000}$	$\frac{1}{10000}$

The silver test is much the most delicate, and even in solution  $\frac{1}{500000}$ th of a grain can be detected, but the author does not consider the proof complete unless cyanogen is actually detected on ignition. The omissions referred to above are: first, that the quantitative estimation of the acid by standard silver nitrate is not noticed, although it is very delicate and satisfactory; and, secondly, that there is no mention of essential oil of bitter almonds. The last omission is a serious one, for the crude essential oil contains, as is well known, large and variable amounts of hydrocyanic acid, and instances of poisoning by it are by no means rare. In a somewhat recent case one drachm of the crude oil, taken internally, proved fatal in an hour and a half, and it was found afterwards that not less than one grain of hydrocyanic acid was contained in the oil. The separation both of oil and acid from the contents of the stomach is easily effected. The matters, mixed with water, are rendered faintly alkaline with potash and distilled. The oil distils with the water, and can readily be identified by its smell and by its spontaneous oxidation into benzoic acid. Hippuric acid is, moreover, found



in the urine in abnormal quantity. When the oil has passed over, the flask is cooled, the contents slightly acidulated and warmed in a stream of air, the hydrocyanic acid which is now evolved being received in a series of small bulbs containing a solution of potash. The detection and estimation of the acid are then, of course, easy.

The section on arsenic is one of the best in the book. Here the valuation of the tests is most excellent and the manipulations necessary for the utmost accuracy are described with great lucidity. Almost the whole of the analytical and descriptive portions deserves reproduction, and will repay attentive study. There is, to begin with, an experimental study of the solubility in water of the different varieties of white arsenic, which serves to account for the discrepancies of previous observers, although it does not explain the variations, which, indeed, are enormous. Probably definite and even, perhaps, isomeric hydrates exist which have different solubilities. The experiments would have had even greater value if the temperature at which they were made had been recorded.

Still more important is the account of Reinsch's test, which is more commonly used than any other. Its limits of delicacy are defined as follows: In each case one grain of solution containing various quantities of white arsenic was used, and a fragment of pure bright copper foil measuring  $\frac{1}{10}$ th by  $\frac{1}{20}$ th of an inch heated in it, in a thin watch-glass, after acidulation with pure hydrochloric acid. When the solution contained  $\frac{1}{50000}$ th of a grain of white arsenic a distinct deposit was obtained, but with  $\frac{1}{100000}$ th of a grain only a very slight tarnish. In the former case the copper, heated in a minute capillary retort, yielded in some cases as many as fifty crystals in each field of the microscope, each crystal well marked in form, and each measuring from the  $\frac{1}{3000}$ th to the  $\frac{1}{10000}$ th of an inch in diameter. Crystals of  $\frac{1}{5000}$ th of an inch diameter do not weigh more than  $\frac{1}{200000000}$ th of a grain! With sulphuretted hydrogen  $\frac{1}{100000}$ th of a grain of white arsenic can be detected. The silver and copper tests are much less delicate. Marsh's test, on the contrary, is marvellously sensitive when the evolved gas is decomposed by heat. In one experiment  $\frac{1}{500000}$ th of a grain of white arsenic was detected in the presence of 5,000,000 parts of liquid. Professor Wormley doubts whether any other test known to chemistry is as delicate. Some valuable notes on the occurrence of arsenic in glass, confirmatory of the results of Dr. W. Fresenius, are appended; and also some recent cases illustrative of the admitted fact that arsenic may become diffused throughout a body when introduced *post mortem*.

The copper test for mercury is not less delicate than for arsenic. The manipulation is the same. The minute fragment of copper is heated in the same capillary retort, which need not be more than two inches long, and the beads of mercury are detected and measured by the microscope. In an extreme case  $\frac{1}{500000}$ th of a grain of corrosive sublimate yielded 20 mercurial globules varying in diameter from  $\frac{1}{3000}$ th to  $\frac{1}{10000}$ th of an inch. Much smaller globules can be measured on a flat surface, and with an eighth power a globule measuring  $\frac{1}{25000}$ th of an inch in diameter and weighing only  $\frac{1}{900000000}$ th of a grain is visible. But as to the practical separation of mercury, it is found that "even under the most favorable conditions the least quantity of corrosive sublimate from which the mercury can thus be reproduced is about  $\frac{1}{1000000}$ th, or at least  $\frac{1}{500000}$ th of a grain." It is to be regretted that no information is given as to the toxic action of some other mercury compounds beside corrosive



sublimate. We should have been glad of the latest opinions as to the injurious action of the subchloride, the sulphite, and white precipitate. Professor Attfield found that vermilion is so inert that it can scarcely be classed among poisons, a fact of no little importance, considering how constantly it is used as a pigment.

Lead, copper, and zinc follow mercury in order of treatment. On the whole, there is little in regard to them which calls for comment. In regard to copper, it may be remarked that it is still doubtful whether its continued use in small quantities can be considered as poisonous. The question is very important, for it is notorious that copper salts have often been used to impart an attractive green color to preserve provisions, and public analysts have often been called upon to express an opinion whether a minute addition of this kind constitutes an adulteration "injurious to health." The fact that a large dose of blue vitriol is poisonous proves no more than that a similar dose of saltpetre has been known to be deadly, which no one doubts. But as to the "frequently repeated small doses" there is yet but imperfect evidence. No one seems to know what the small doses have been.

In this, as in some other parts of the book, the quantitative methods described are decidedly inferior to the qualitative. There is only one satisfactory way in which to estimate copper in an organic mixture. The mixture must be burnt completely to actual ash. Incineration to charcoal is insufficient, for the charcoal holds some of the copper with tenacity. Then the ash, dissolved in dilute sulphuric acid, filtered, and, if necessary, concentrated, must be placed in a weighed platinum basin, and either treated with pure zinc, or exposed to a voltaic current with the platinum for negative electrode. In either case the copper will adhere to the platinum, which may then be washed, dried, and reweighed.

The second part of the book is occupied exclusively with vegetable poisons, or, to be accurate, with a certain number of the more important alkaloids and the vegetable substances from which they are derived. As a matter of course, the introduction describes the various general methods by which the poisons are isolated with a view to their individual detection, and equally, as a matter of course, the method of Stas, with its subsequent modifications by Otto and others, stands first. In the main, it is an excellent process, and the systematic detection of alkaloidal poisons may be said to date from the time, 1851, when Stas's memoirs appeared. Otto's modification, which is in many cases a distinct improvement, consists, as is well known, in removing, by means of ether, fat and other substances from the acid salt of the alkaloid before the separation of the alkaloid itself. For the subsequent isolation of the alkaloid, chloroform is a more generally useful solvent than ether. In the case of morphine, amyl alcohol is a better solvent than ether. The charcoal process of Graham and Hofmann, and the interesting dialytic method of the former chemist, from which so much was once expected, are properly dismissed as inadequate for modern requirements. The great objection to dialysis is the imperfection of the septum. Fine animal membrane gives much better results than vegetable parchment, and it is not impossible that even yet some practical good to toxicology may come of dialysis. Hitherto, however, it has been practically useless.

Of much greater interest at the present time is the ingenious system devised by Dragendorff, by which mixed alkaloids and some other allied substances can be separated from one another. The substance to be ex-

aminated is acidulated with sulphuric acid and extracted with water. The evaporated aqueous extract is extracted with alcohol at a low temperature, and the alcohol distilled off. The concentrated acid extract is then treated, successively, with petroleum, ether, benzene, and chloroform; it is then rendered alkaline by ammonia, and again treated in turn with petroleum ether, benzene, chloroform, and amyl alcohol, which last removes morphine and some other substances which are supposed to have been left untouched in the previous operations.

Now, this system of Dragendorff's is easy to criticise, and it is impossible to deny the truth of some of the objections which Professor Wormley and others have pointed out. It is true that "few, if any, of the bodies are wholly insoluble in the different extracting fluids employed," and also that the evaporation with sulphuric acid is objectionable, but none the less it is valuable, not only as the first attempt at the systematic separation of alkaloids, but also, and much more, as affording a kind of synopsis of separative methods. That it does not enable us to analyze perfectly a mixture containing a dozen different proximate principles, some of which are present in very minute quantity, must be freely admitted, but such cases do not often occur, and when they do, we have no better method to fall back upon.

The poisons described in the succeeding pages are nearly all well known, and are sufficiently indicated by the titles of the six chapters. These are: Volatile alkaloids (nicotine, conine); Opium; Nux vomica; Aconitine; Atropine and Daturine; Veratrine, Vervine, and Solanine; and Gelsemine. The deficiencies of this list are obvious, and it must be hoped that, at any rate, the more important omissions will be rectified in the next edition, which will certainly be wanted before long. The history, as far as it goes, is good. A great many cases are quoted which will be requoted in future trials, and the tests recommended have, in the great majority of cases, been subjected to careful personal trial by the author. The section devoted to strychnine is a good sample of the whole. The limit of delicacy of the well-known bichromate test is thus stated:  $\frac{1}{100000}$ th of a grain of the alkaloid is easily detected, and if due care be taken to concentrate the solution on one point of the basin, and to add the bichromate suddenly and in very minute quantity to that point, previously touched with sulphuric acid, an even smaller quantity can be found.

In Chapter IV. nearly twenty pages are devoted to aconitine, which, since the Lamson trial, has been very interesting. Some account, but not a very full or perfect one, is given of Dr. Wright's researches. No satisfactory chemical test for the alkaloid has as yet been obtained.

The chapter on gelsemium, added in the new edition, possesses additional interest because Professor Wormley himself, in 1870, showed the nature of the active principle. The yellow jasmine (*gelsemium semper-virens*), and particularly the root bark of the plant, contain a very poisonous alkaloid called gelsemine, and a non-nitrogenous acid, gelsemic acid, which was at one time erroneously supposed to be æsculin. A decoction of the bark is rendered alkaline with ammonia, agitated with ether, and the ethereal extract carefully treated with hydrochloric acid, when the hydrochlorate of the alkaloid separates in characteristic crystals. By evaporation, the acid can then be obtained from the ethereal solution in tufts, which can be purified by crystallization from alcohol. Both the alkaloid and acid appear to be poisonous, the former

in an eminent degree. Fortunately, both are easily detected: the former by a bluish-green coloration, which is produced after treatment with nitric acid and spontaneous evaporation, and by a blue color produced, as in the strychnine test, by the action of sulphuric acid and potassium dichromate. From the author's description, however, it would appear that the latter reaction must be due to some impurity, for he tells us that it no longer occurs if the sulphuric acid has been warmed with the alkaloid, although the alkali itself is not destroyed (p. 695). The acid in the pure state, and, still more strongly, in alkaline solution, gives an intense blue fluorescence, which no doubt led to its being mistaken for aesculin. The acid requires 2912 parts of cold water for solution, but is soluble without change in sulphuric acid as well as in alcohol, ether, and chloroform. From the sulphuric solution, ammonia throws down the acid in crystalline needles very easy to identify. Professor Wormley gives a drawing of the crystals obtained by the addition of ammonia to a drop of solution containing only  $\frac{1}{10000}$ th of a grain of the acid. Altogether it appears that the secret poisoner had better avoid yellow jasmine.

With gelsemium the toxicological portion of the book ends; but in the new edition there is an appendix of forty pages on Blood: its composition, detection, and discrimination; which is important, not only for the epitome which it offers of our present knowledge, but also on account of the careful work which the author has accomplished in his own laboratory, and which is here fully described. In the following summary it will not be necessary in every case to distinguish between original observations and those of other workers.

After a general account of the nature and properties of blood in which the size and form of the corpuscles are slightly noticed, the action of water and reagents on red corpuscles is described, and the modern view in regard to the nature of those bodies explained. Unfortunately, neither here nor in the subsequent pages is the author able to solve that most important problem, the differentiation of human from other mammalian blood. It is well known that in man and all mammalia, except the camel tribe, the corpuscles are circular and non-nucleated. In the camel they are oval, but still non-nucleated; but in birds, reptiles, and fishes they have a distinct nucleus, are almost invariably oval, and are much larger. Then comes the question of identification of blood, which is discussed under the heads of chemical and optical tests, with a final section on the examination of dried blood.

Of the chemical tests enumerated, the only ones of practical importance are the well-known hæmin and guaiacum reactions. When the blood is in solution a drop is evaporated, mixed with a trace of common salt and a drop of acetic acid, and again evaporated and gently heated till it is reddish-brown. The mass then exhibits under the microscope crystals of hæmin (hydrochlorate of hæmatin, according to Hoppe-Seyler), which are very characteristic. The guaiacum is very delicate. The following case is recorded from the author's experience:

A piece of muslin one-tenth of an inch square, containing a moderate blood stain of ten years' standing, was macerated with a few drops of water for a few hours. The liquid, which had acquired only a faint reddish hue, was then decanted and evaporated spontaneously, when it left a smooth ring-like deposit of a faint reddish-yellow color. This, under the action of the test (fresh alcoholic tincture of guaiacum, followed by ethereal solution of hydrogen peroxide), immediately assumed a deep blue color. So, also, a



minute portion of a single thread of the soaked material immediately acquired a deep blue color on the application of the reagents" (page 10).

In a subsequent paragraph we are warned that the reagents should be added separately; that the guaiacum alone should produce no color; and that, after the addition of the hydrogen peroxide, the blue coloration should appear "very promptly."

The optical tests are described at length, and include, not only the spectroscopic examination, but also the measurement of corpuscles, about which so much has been written. The discoveries of Hoppe-Seyler and Stokes are first described, and also the Sorby micro-spectroscope. In one of Mr. Sorby's beautiful little barometer-tube cells it is very easy to get a distinct spectrum with a solution that contains only  $\frac{1}{1000}$ th part of its weight of recent blood. Mr. Sorby, indeed, obtained a faint spectrum from a single blood corpuscle. The methæmoglobin and hæmatin spectra, acid, alkaline, and reduced, are also described; and these, as well as the other blood-spectra, are illustrated by a chromo-lithograph. It would have been better if the absorption bands had also been given in wave-lengths. In the examination of blood stains, it is, of course, possible that hæmoglobin, methæmoglobin, or hæmatin may be found, any one of them being equally conclusive proof of the presence of blood. With a very minute spectrum of hæmoglobin we are advised to convert into hæmatin with citric acid and afterwards reduce with iron salt. In that way three characteristic spectra can be obtained. No mention is made of Dragendorff's proposal to use borax solution for the removal of blood stains. It has, however, much to recommend it.

Not less important than the spectroscopic tests, although, unfortunately, not so generally applicable, are measurements of the size of corpuscles. After describing the methods of preparing blood-clots, new and old, for the microscope, Professor Wormley discusses the limit of determining differences and the methods of microscopic measurement. For mounting the sample and obtaining an even distribution, he recommends the method of Professor Johnston, of Baltimore, which consists in dipping the ground end of one slide in the blood to be examined and drawing it obliquely along another or along a cover. In the latter case the cover will, of course, be placed on a clean glass slide. The mean size can only be calculated from the very laborious measurement of a great many corpuscles. In the first series described, 500 corpuscles of human blood were measured, with the following results:

385, or 77.0 per cent., were from	$\frac{1}{30777}$	to	$\frac{1}{3389}$	of an inch.
42, " 8.1 "	$\frac{1}{3389}$	"	$\frac{1}{3636}$	" "
20, " 4.0 "	$\frac{1}{3636}$	"	$\frac{1}{4000}$	" "
49, " 9.8 "	$\frac{1}{4000}$	"	$\frac{1}{2398}$	" "
4, " 0.8 "	$\frac{1}{2398}$	"	$\frac{1}{2317}$	" "

with an average of  $\frac{1}{3253}$ th of an inch. Two other series from different samples of blood gave results which are practically identical. Under certain circumstances the average sizes of the corpuscles may be slightly less than the above fraction, but they never increase.

Then follow tables in which the author's measurements of the corpuscles of various mammals, birds, reptiles, batrachians, and fishes are compared with those obtained in the classical researches of Gulliver. In very few cases is there any important difference, the most notable being with regard to the opossum. A very useful microscopic chart



illustrates this part of the book by showing the comparative apparent size of the blood corpuscles of several important animals under equal microscopic power. The whole study leads inevitably to a conclusion which must be stated in the author's own words:

"The microscope may enable us to determine with great certainty that a blood is *not* that of a certain animal, and is *consistent* with the blood of man; but in no instance does it, in itself, enable us to say that the blood is really human, or indicate from what particular species of animal it was derived."

In conclusion, it must be said that the microscopic drawings are not only of remarkable beauty, but, judging from well-known cases, of great accuracy; and, as their scale is given in every case, and minute directions for reproducing the originals, they have the highest value. They were all executed, we are told, by Mrs. Wormley, to whom the book is most appropriately dedicated, and who has earned the thanks of every scientific man.

C. W. H.

#### RECENT WORKS ON DISEASES OF THE GENITO-URINARY SYSTEM.

URINARY AND RENAL DERANGEMENTS AND CALCULOUS DISORDERS.

HINTS ON DIAGNOSIS AND TREATMENT. By LIONEL S. BEALE, M.D., Fellow of the Royal Society, etc. 8vo. pp. vii. 356. Philadelphia: P. Blakiston, Son & Co., 1885.

A PRACTICAL TREATISE ON URINARY AND RENAL DISEASES, INCLUDING URINARY DEPOSITS. Illustrated by numerous cases and engravings. By WILLIAM ROBERTS, M.D., F.R.S., etc., assisted by ROBERT MAGUIRE, M.D., etc. Fourth edition. 8vo. pp. xvi. 628. Philadelphia: Lea Brothers & Co., 1885.

A PRACTICAL TREATISE ON DISEASES OF THE KIDNEYS AND URINARY DERANGEMENTS. By CHARLES HENRY RALFE, M.A., M.D. Cantab., etc. With illustrations. 8vo. pp. xii. 572. Philadelphia: P. Blakiston, Son & Co., 1885.

ON RENAL AND URINARY AFFECTIONS. By W. HOWSHIP DICKINSON, M.D. Cantab., F.R.C.P., etc. MISCELLANEOUS AFFECTIONS OF THE KIDNEYS. 8vo. pp. x. 343. New York: William Wood & Co., 1885.

THE PATHOLOGY AND TREATMENT OF STRICTURE OF THE URETHRA AND URINARY FISTULÆ. By SIR HENRY THOMPSON, F.R.C.S., M.B. Lond., etc. Fourth edition. 8vo. pp. xii. 254. Philadelphia: P. Blakiston, Son & Co., 1885.

THE last year or two have been marked by unusual activity in the study of disorders of the genito-urinary apparatus, both functional and organic. In regard to the former, there have been important investigations by a considerable number of English physicians, while in regard to the latter the most marked activity has been on the Continent. One of the results of this state of affairs is the appearance of a number of new, or newly edited, works on the diseases of the genito-urinary organs, five of which, coming from Great Britain, are before us for review. We

shall therefore take them up together, considering first those which treat of diseases of the secreting apparatus, and then the one which treats of the disorders of the channel of exit for the urine.

When a book of hints covers more than 350 pages it must be very good indeed to escape being shoved aside by systematic works, amid the press upon the time of busy men. The book of DR. BEALE has attained to this length without, we think, attaining this standard of merit. It is certainly, in some respects, a good book, and calculated to be of benefit to those who have the time to go through it. But it is by far too prolix and diffuse to be recommended to those who are in any hurry.

As a sample of the author's style, we may cite a few lines from his chapter on Urinary Deposits: "The subject of urinary deposits," he says, "must always be of interest to the practitioner, and it is of considerable practical importance. In consequence of the expansion of other departments of medical inquiry, less attention has been given to urinary deposits of late years than formerly, but as no one can successfully treat many forms of urinary disease, unless he is familiar with the character of urinary deposits, and acquainted with the methods, chemical as well as microscopical, of identifying them and demonstrating their exact nature, the practitioner should take every opportunity of studying the character of the deposits commonly found in urine in various cases of derangement and of actual disease." Here is an excellent idea spread out in an involved sentence, three times as long as it ought to be. It is succeeded by the following disheartening, and, happily, too gloomy, enunciation: "Considerable practice in the wards of the hospital and some patience are necessary for any one who would become familiar with the multitudinous forms of the substances which constitute urinary deposits." Now no one who has paid special attention to the study of deposits in the urine will deny that it does require considerable practice and great care to acquire a knowledge of *all* of the "multitudinous forms" which are to be seen in some deposits; and yet it is just as true that a very limited experience, combined with scrupulous carefulness, will suffice to put one in a position to recognize those which are most common and most important. It is partly because so many men think the examination of urine a very difficult matter that so few know its essentials, which are quite within the reach of everybody.

The laxness of the author's expressions is seen in such sentences as the following: "Among the least common forms of opalescent urine, is that which depends upon an admixture of chyle, known as 'chylous urine.' The fluid is white and opaque. . . . Most of the cases observed, it will be found, originated in the tropics, where the condition is by no means uncommon. . . . Both urates and fatty matter in a molecular state as it exists in chylous urine exhibit molecular movements," etc.

We must let this suffice to indicate what we believe to be a very serious fault of manner in this book. As to its matter, we can in the main commend it very highly. There are here a great many practical suggestions, which are the fruit of years of study and experience, and which cannot fail to be of service to those who have had less of both than the author has had. We cannot but think, however, that a little more of the surgical spirit might have helped him to better results than he reports in some of his cases of so-called irritability of the bladder, as in one where after three months of treatment the patient was able to hold his water

for an hour (!) at a time; or in that in which the patient after a year's medication managed to retain his urine for three or four hours.

The chapter on *Derangements of the Sexual Functions* attracts us by its high order of moral excellence. It reads like an anticipation of the present revulsion of sentiment in England in regard to sexual indulgence. It handles a delicate subject in a clean way, and, while it is sometimes more like a sermon than a treatise addressed to medical men, it maintains what is right and pure, and deserves admiration for this.

It has been impossible to subject this book to a systematic criticism, because it is so unsystematic a book. The title adopted by the author seems to deprecate too strict a judgment of it; and it may perhaps be best to look rather at the merits of Dr. Beale's ideas than at the loose and shapeless garb in which they present themselves.

The design of DR. ROBERTS'S work is, in the author's words, to give an account of the organic diseases of the kidney, and of those diseases and disorders of which the chief characteristic is some alteration of the urine. The first part of it comprises a study of the normal physical and chemical characteristics of the urine, and of those which take their place in disease. This is managed in a way which is both simple and comprehensive. No attempt is made to imitate the elaborate methods described in many of the German treatises on analysis of the urine, and yet enough is explained to make it possible for any one to learn how an examination of a suspected urine ought to be conducted. The cuts which accompany this part of the book are most excellent, those which figure the various deposits in the urine being of a kind which are indispensable to the student or practitioner, unless unusually experienced in the microscopical examination of sediments.

The second part of the book treats of what the author calls "urinary diseases," which might, perhaps, be more accurately designated "functional diseases of the urinary apparatus:" that is to say, diabetes mellitus and insipidus, gravel, and chylous urine. Why the author does not class paroxysmal hæmoglobinuria with these we cannot see.

The third, and largest, part of the book treats of organic diseases of the kidneys in a very full and satisfactory manner; and, finally, entozoa, and anomalies of position, form, and number of the kidneys are considered.

The previous editions of this book have made it so familiar to, and so highly esteemed by, the medical public, that little more is necessary now than a mere announcement of the appearance of this, their successor. But it is pleasant to be able to say that, good as those were, this is still better. In fact, we think it may be said to be the best book in print on the subject of which it treats. A good peculiarity of the book is, that the illustrative cases which it contains have been most judiciously introduced. Reports of cases are apt to constitute a much more considerable addition to the volume than to the worth of books; but here it is different: the cases are so well selected, and so well described, that they add very much to the value of the more didactic parts of it.

There are a few points on which our opinion does not quite coincide with that of the author, and there are one or two matters which are treated in what seems to us an inadequate way. Examples of this are to be found in the few paragraphs devoted to leucin and tyrosin, which are disposed of as if the author was rather glad to get them out of the



way; as he well might be in view of the little that really is known about them. Perhaps we would have been better satisfied with this brevity, if it had admitted of some statement from the author as to the comparatively slight significance of these sediments, in view of the fact that they are hardly ever found, and when found, are rather known by the general condition which they accompany, than it is known by them.

The bibliography at the end of the book is interesting, as indicating the sources from which, in addition to his personal experience, the author has drawn his information.

As a whole, this new edition of Dr. Roberts's book is not only worthy of all the reputation which the previous ones have gained, but is better still than they were. It is a source of regret that we cannot give it a more extended review, but this regret is mitigated by the thought that "good wine needs no bush." The author's acknowledgment of the services of his colleague, Dr. Maguire, in bringing the work up to the level of the present state of knowledge on the subject indicates the share of credit which he deserves for its excellence.

Finally, we may add that the mechanical execution of the book is on a par with its literary and scientific merits, and well sustains the reputation of the publishing house from which it comes.

The title and the opening sentence of the preface of DR. RALFE'S book furnish illustrations of a common practice which we believe to be a fault, namely, the incorrect use of the adjective "urinary" in the expressions "urinary derangements," "urinary pathology and therapeutics." These, doubtless, indicate the derangements of the urinary apparatus, and the pathology and therapeutics of these derangements; but they might be naturally construed to mean derangements and a pathology which in some way have the qualities of the urine, and therapeutics such as are said to be employed in certain parts of Asia, where urine is used as a remedy.

The object of the volume is stated by the author to be to present the student and practitioner with a clear, concise, and systematic account of this subject. And he has succeeded admirably in the task set before him; for his book is really clear and concise, and far more complete than books of the same class usually are. It opens with a chapter on the general symptomatology of kidney diseases. This includes changes occurring in the kidneys themselves, and those taking place in the vascular system elsewhere, as well as manifestations of nervous disturbance, and of disorders in the eyes, lungs, digestive track, and skin.

In the next chapter there is a very good account of the best methods of examination of the urine. From this we miss one detail which we believe to be very important, and the mention of which cannot be regarded as superfluous; that is, a charge to have the sample of urine absolutely unadulterated. But, with this exception, we should find it hard to improve on what is so well done. The book has been issued too soon, we suppose, to admit of its including among the tests for ingredients of the bile that which has been so recently proposed by Dr. Oliver. Under the head of leucin and tyrosin, it is interesting to find a quotation of the statement of Dr. Anderson, that these are to be found more frequently than has been heretofore recognized, and that they are to be met with in a number of pathological conditions of the liver.

On page 151 we observe the remarkable classification of a number of



deposits as "organized," not one of which is organized in the proper sense of this term, and one of which—the ammonium-magnesium phosphate—cannot even be called organic, the term which the author should have applied to the whole class.

The remaining chapters of the book deal with the various diseases to which the kidneys are subject. As an example of their excellence, we may cite the section on movable kidney. Here we might, however, interpose a suggestion as to the expression of the author that the kidney is a retroperitoneal organ. To be precise, we doubt that this can be held to be a feature peculiar to the kidney. It is true it lies behind the peritoneum; but so do all the abdominal viscera. The others differ from the kidney in the fact that they are closely and almost entirely surrounded by the peritoneum, having only a slender stalk to connect them with the framework of the body, while the kidneys are but loosely invested by this membrane, and usually only upon one side. In cases of movable kidney, however, the organ must have a peritoneal pouch in which it is almost wholly included, and which makes it resemble more nearly the other viscera, *quoad hoc*. Like them, the kidney is derived from the mesoblast in the embryo, and the lamination which leads to the differentiation of a peritoneal coat, closely hugging the other viscera and leaving a slight interval between it and the capsule of the kidney, is a single developmental process, differing only in degree in different parts of the abdominal cavity. Only such a conception of the development of the coverings of the kidney can explain the phenomena of floating kidney. The author himself must have recognized this, for he speaks of the kidney being sometimes surrounded by the peritoneum and connected with the spine by a double fold of membrane called the mesonephron.

A short appendix at the end of this book gives the methods of quantitative analysis most commonly used, and a good index concludes it.

As already intimated, this book seems to us to be worthy of high commendation. It is not without some minor blemishes; but, as a whole, it is remarkably trustworthy. Its style is clear, and the illustrations are generally good, many being very good indeed. Modern taste seems to justify the binding of books of a serious sort in gay, and, we might almost say, frivolous colors. So this one appears in a gorgeous red cover. Perhaps this is better, than that a severe taste should make one's shelves monotonous.

DR. DICKINSON'S book is an American reprint of the third part of his valuable treatise on the disorders of the urinary apparatus. As a whole, this work is a monument to the experience and research of its author, and of its three parts that now before us is in some respects the most important. It is rich in the details of the subject which it considers, and would be invaluable to any special student of it. We have not found it possible to follow the author to the conclusion of all of his arguments; that in regard to the pathology of chyluria, for instance, which seems to us to be far from explicable at present. But, in the main, the matter of his book has secured our admiration. Unfortunately, we cannot say the same of the style in which the matter is clothed. This is sometimes very poor indeed. In the first place, the title contains the misuse of the word "urinary," to which we have taken exception in commenting upon the book of Dr. Ralfe. Our objection to this may be hypercritical, and certainly these two authors are not peculiar in using the word in the manner

to which we object. Still, we think it worth while to call attention to the matter, as it is in some sense an index of a laxity of style which strikes us as spreading. The very book before us, for example, is full of errors of style which detract very much from its charms. For example, we read, on page 9, that certain patches "are surrounded and intermingled with *vascularity*." On page 151 we are told that "On the observation of Dr. Ord indigo must be added to the list of substances which *concrete* in the kidney." On page 211, it is said "Vesical *irritation and frequency* have occasionally been noticed." In the preface, the author says: "It was my design to follow the publication of *Albuminuria* with an account of the other renal and urinary diseases sufficient for the practitioner, and not too lengthy (!) for the student." Another paragraph says: "I have not hesitated to fill up the deficiencies of my own observation with that of others." And again: "Pains have been taken to make each subject level with the time."

With this criticism, however, we are at an end of our fault-finding. The matter of the book is so excellent that it more than outweighs the defects of style to which we have referred. It is very interesting to see the range of the author's reading, from the antique account of Ambroise Paré of the vivisection of the *Franc-Archer de Meudon* (which he does not state was attributed to that famous old lithotomist, Germain Colot), in search of the seat of the pains of nephritic colic, to the *Transactions of the College of Physicians of Philadelphia*. The investigations into the statistics of nephrectomy, made by Dr. Harris, of Philadelphia, and published in this Journal in 1882, have not escaped the author's attention.

Some of the cuts in this book are very good, and some of them are very bad. The general appearance of the publisher's work is about the same as is found in other books of this "Standard" series. It will probably give the author some pain to contrast this with the appearance of his English edition, but if he gets a suitable honorarium he may be consoled. For the reader it is different; he will probably be glad to get what the author has written so much cheaper than he could get the original edition, and he may be thankful to have it brought within his reach, even at a little sacrifice of its appearance.

There is not much to say in announcing the appearance of another edition of SIR HENRY THOMPSON'S well-known book. In it the author has brought his treatment of the subject up to the position of the present state of knowledge, and has simply improved what was before a standard work. The bulk of the book has been reduced about a hundred pages by the removal of discussions in regard to matters which have passed beyond the stage of controversy, and which can now be treated of in a shorter and more authoritative manner. The illustrative cases have also been removed, the author having substituted for them bare statements of his personal opinions, a method decidedly advantageous to the student, and warranted by the high position which Sir Henry Thompson occupies in regard to this subject.

The mechanical execution of the book is of a quality which is well fitted to the work of the writer; paper, printing, and binding being all excellent.

C. W. D.

A PRACTICAL TREATISE ON THE DISEASES OF CHILDREN. Third American from the eighth German edition. Revised and enlarged. Illustrated by six lithographic plates. By ALFRED VOGEL, M.D., Professor of Clinical Medicine in the University of Dorpat, Russia. Translated and edited by H. RAPHAEL, M.D., late House Surgeon to Bellevue Hospital; Physician to the Eastern Dispensary for the Diseases of Children, etc. 8vo. pp. 640. New York: D. Appleton & Co., 1885.

COMPARATIVELY few medical books have been so distinctly stamped with the seal of professional approval as has Professor Vogel's Treatise on the Diseases of Children. Having reached the eighth edition in German, and having been translated into all of the principal languages of the civilized world, there remains but little for the bibliographer to do save to chronicle those changes which keep the work abreast of current pediatric literature.

The previous American edition was based upon the fourth German; the present one corresponds to the eighth German edition. While the text affords abundant evidences of revision, it has not, except in a few instances to be presently mentioned, undergone any very material alteration in the fifteen years which have elapsed since its translation. In fact, the added matter amounts to less than forty pages, fully one-half of which is supplied by the editor, while the scissors have been used very sparingly—perhaps too sparingly. The editor has performed his share of the revision acceptably, and his annotations materially add to the value of the book. He has, moreover, inserted an article on cerebro-spinal meningitis, which subject is not discussed in the author's edition.

The arrangement of the subject-matter is considerably altered and improved; for example, diphtheria is now placed in the group of miasmatic diseases, instead of, as formerly, among the diseases of the digestive apparatus (mouth).

Scarlatina and kindred affections are transferred from the chapter on skin diseases to a separate one headed "Eruptive Fevers." It, however, seems questionable whether pemphigus benignus (contagiosus) properly belongs in this chapter.

The most important additions to the text are found in the chapters on artificial nutrition, on the difficulties of dentition, on nervous diseases, and on diphtheria.

In the excellent chapter on the "Nursing and Care of Children," Prof. Vogel briefly discusses, for the first time, the danger of transmitting tuberculosis to the infant by the use of milk from infected cows. While according due consideration to experimental facts, he concludes that: "The numerous experiments with rabbits, sucking-pigs, and the like, are by no means capable of rendering satisfactory conclusions for the human being; moreover, the assertions that tuberculosis was produced in the human being by the use of milk and meat of consumptive animals, always leaves room to suspect the existence of an hereditary taint, which is now so widespread among the masses." Nevertheless, in the presence of suspicious circumstances, he deems it best to adhere to the old rule of using none but boiled milk, "since boiling destroys all spores, germs, and contagious particles."

We would be glad to note greater changes in the sections devoted to



the diarrhœal maladies. While it may be true that there is no essential difference in the etiology or pathology of cholera infantum and the other forms of summer diarrhœa, yet typical cases of the former contrast so strongly in symptomatology and fatality as certainly to entitle it to a separate section. The author still adheres to his method of administering opiates to nurslings, a method which seems singularly inexact and dangerous. "Medicine can seldom, if ever, accomplish much in children at the breast, because most of them unwillingly take anything from a spoon, and spit the fluid out again that has been poured into the mouth. For these reasons the pencilling of the mouth with laudanum is the most convenient and practical procedure. For this purpose I use a camel's-hair brush, dip it into the laudanum, shake off the first drop by snapping it with the finger, and then introducing it into the mouth of the child, press the chin a little upward, and pull the brush out from between the compressed lips. In this manner about half a drop is left in the mouth, and if two or three drops of water are dripped upon the tongue, the child will swallow all of the contents of its mouth without delay."

The importance of a proper diet in the treatment of the digestive disorders of early life is strongly emphasized throughout the section, and it is boldly stated, "had I the choice, when compelled to treat an intestinal catarrh by diet or by medicine only, I would prefer the dietetic treatment."

The chapter on the diseases of the respiratory organs, covering about sixty pages, is one of the best in the book, yet a certain amount of scepticism is pardonable in regard to some of the author's statements. For instance, we are told that "empyema occurs so rarely in early infancy that the most experienced Pediatricars (?) have only been able to report a few solitary instances. On the other hand, general pleuritic adhesions are often found in young children, who, during life, suffered from pulmonary affections, particularly from phthisis pulmonalis. In older children empyema occurs not infrequently, becomes, when no complications are present, tolerably quickly absorbed, and leaves behind it no remarkable deformity of the thorax. Altogether, pleurisy in the first age of childhood may be regarded as an extraordinarily rare affection, and as a tolerably infrequent one after the beginning of the second dentition."

Pleurisy is certainly not as rare in early life as the above quotation would imply, and we know of no other author who speaks so confidently of the cure of empyema by the absorption of the pus.

*Roob juniperi*, which the translator, in a foot-note, informs us is the succus spissatus juniperi of the European pharmacopœias, and is somewhat stronger than a fluid extract, is praised as the best of all diuretics for the removal of pleuritic effusions. The nitrate and acetate of potash are ineligible on account of their bad taste and drastic effect, while the iodide, so justly popular in this country, is not even mentioned.

The principal changes noticed in Chapter V., on Diseases of the Nervous System, are the insertion of a short article on Suctus Voluptabilis (voluptuary indulgence), or in plain English "thumb-sucking," and a few notes on the etiology and prognosis of essential paralysis. This latter article is still susceptible of much improvement. We have long considered Dr. Vogel's article on tubercular meningitis as one of the best short descriptions of the disease with which we are familiar.

Aside from alterations in the arrangement, the only change made by



the author in the section on diphtheria consists in the insertion of two or three lines on the use of apomorphia as an emetic in croup, but the editor has wisely introduced some of the later investigations on this subject.

The article on abdominal typhus, although not altered in the present edition, is deserving of special mention as being a full and excellent exposition of an important subject which is too often ignored by writers on the diseases of children.

The morbid alterations which typhus (typhoid) fever brings about in the infantile organism are not so decided as in the adult; and since the symptoms are, as a rule, correspondingly less intense, he who is not aware of these facts is liable to be slow in recognizing the disease.

Prof. Vogel strongly advises against the use of all debilitating remedies or measures from the first indication of the disease. Cold is looked upon as the best remedy for reducing fever and relieving congestion of the head. The antipyretic action of chinin, salicylic acid, and eucalyptus, so generally recommended by late writers, is stated to be by no means always permanent or marked. The following paragraph, to which the translator offers a mild protest, reads queerly in the light of modern teaching :

“The restlessness of a typhous child interferes with the use of the thermometer to determine the temperature of its skin, because, as is well known, the instrument must be entirely surrounded by integument, and allowed to lie quietly for from fifteen to twenty minutes. It is therefore better to observe the warmth of the forehead, trunk, and extremities, with the hand previously warmed, no matter under what disease he may be laboring, and this kind of examination, practised a few hundred times, gives such an amount of skill, in distinguishing the different degrees of temperature, that thermometric measurements, always requiring a certain amount of time, and often totally impossible, will be entirely unnecessary for any practical purpose.”

As above stated, the editor has supplied a good article on cerebrospinal meningitis. It is held to be a specific infectious disease, with localization upon the meninges of the brain and cord, analogous to diphtheria, with its manifestations upon the tonsils and throat. The erratic character of the epidemics, the great variation of the symptoms in individual cases, and the difficulties of diagnosis, are distinctly set forth. Chapter IX., which concludes the book, contains an excellent *résumé* of existing knowledge on rachitis, scrofulosis, and tuberculosis, although there are but few changes from the text of former editions.

In conclusion, this edition will doubtless receive the same cordial welcome from the profession which has been heretofore accorded the successive issues of Dr. Vogel's treatise, and to which it is justly entitled by its merits.

W. J. C.

## RECENT WORKS ON CHEMISTRY.

PRINCIPLES OF THEORETICAL CHEMISTRY, WITH SPECIAL REFERENCE TO THE CONSTITUTION OF CHEMICAL COMPOUNDS. By IRA REMSEN, Prof. of Chemistry in the Johns Hopkins University. Second edition, thoroughly revised and enlarged. 12mo. pp. 242. Philadelphia: Henry C. Lea's Son & Co., 1883.

INORGANIC CHEMISTRY. By EDWARD FRANKLAND, Ph.D., D.C.L., LL.D., F.R.S., Prof. of Chemistry in the Normal School of Science, London, and FRANCIS R. JAPP, M.A., Ph.D., F.I.C., Assistant Prof. of Chemistry in the Normal School of Science, London. 8vo. pp. 693. Philadelphia: Lea Brothers & Co., 1885.

• A TREATISE ON PRACTICAL CHEMISTRY AND QUALITATIVE INORGANIC ANALYSIS, ADAPTED FOR USE IN THE LABORATORIES OF COLLEGES AND SCHOOLS. By FRANK CLOWES, D.Sc. Lond., Prof. of Chemistry at the University College, Nottingham. From the fourth English edition. 12mo. pp. 376. Philadelphia: Lea Brothers & Co., 1885.

MANUAL OF CHEMISTRY. A GUIDE TO LECTURERS AND LABORATORY WORK FOR BEGINNERS IN CHEMISTRY. By W. SIMON, Ph.D., M.D., Prof. of Chemistry and Toxicology in the College of Physicians and Surgeons, Baltimore, etc. 8vo. pp. 411. Philadelphia: Henry C. Lea's Son & Co., 1884.

THE MEDICAL STUDENT'S MANUAL OF CHEMISTRY. By R. A. WITTHAUS, A.M., M.D., Prof. of Chemistry and Toxicology in the University of Buffalo, and in the University of Vermont, etc. 8vo. pp. 370.

A TEXT-BOOK OF MEDICAL CHEMISTRY FOR MEDICAL AND PHARMACEUTICAL STUDENTS AND PRACTITIONERS. By ELIAS H. BARTLEY, M.D., Adjunct Prof. of Chemistry and Lecturer on Diseases of Children in Long Island College Hospital, etc. 12mo. pp. 375. Philadelphia: P. Blakiston, Son & Co., 1885.

FOWNES' MANUAL OF CHEMISTRY, THEORETICAL AND PRACTICAL. A new American from the twelfth English edition, embodying Watts's "Physical and Inorganic Chemistry." 12mo. pp. 1056. Philadelphia: Lea Brothers & Co., 1885.

CHEMISTRY: GENERAL, MEDICAL, AND PHARMACEUTICAL, INCLUDING THE CHEMISTRY OF THE U.S. PHARMACOPŒIA. By JOHN ATTFIELD, F.R.S., M.A. and Ph.D. of the University of Tübingen, etc. Tenth edition, specially revised by the author for America. 12mo. pp. 727. Philadelphia: Henry C. Lea's Son & Co., 1883.

APPLIED MEDICAL CHEMISTRY. By LAWRENCE WOLFF, M.D., Demonstrator of Chemistry in Jefferson Medical College. 8vo. pp. 174. Philadelphia: P. Blakiston, Son & Co., 1885.

It is possible that a doctor may be a successful practitioner without understanding the mode of preparation, the physical and chemical properties, the incompatibilities, and the chemical antidotes of the medicines

he uses. Likewise there have been famous operators who knew almost nothing about the anatomy of the parts they boldly invaded.

They could cut straight to the mark, and tie any bleeding vessel encountered, without concern as to its name and connections. The doctor and the surgeon have succeeded in spite of their ignorance of many things a knowledge of which most men would find helpful if not essential.

Whatever praise is given to physiology as a fit study for the physician, applies with at least equal force to chemistry. The phenomena of life are in great part chemical processes which must be studied according to chemical laws. The body is still a chemical laboratory, whether these processes are healthy or whether they experience the variations called pathological. The progress of physiology as a science can be measured by the extent to which at the time it has resolved the great organs of the body into physico-chemical apparatuses. The "new chemistry" is based upon the study of atoms, and even at this extreme of refinement it has physiological bearings.

Recent observations indicate that there is a correspondence between the specific atomic grouping and physiological action. It is but one step to those primary changes in the fluids and tissues which initiate disease. Even more significant has been the advance made in zöochemistry along the line of changes induced by the pathogenic bacteria. A thorough knowledge of the infections must take in the chemical products and effects of the microorganisms whose pathological importance is now generally conceded. In the list which heads this review are to be found works widely varying in their scope, but all of which contain facts or speculations more or less intimately connected with medical science. The first in order is the least practical, but by the light of late investigations the study of the molecular constitution of chemical compounds seems destined to help the sciences of physiology and pathology even as that other science of less minute things, biology, has helped them.

PROF. REMSEN, as a chemical teacher, has had occasion to mourn over students devoted to formula worship, a cult to which bright ones seem inclined. Not that there is anything injurious in this exercise of one's invention, but the product is generally appalling to one who knows all that a formula should convey. He has put forth this attempt to guide the tyro in his speculations. It is scarcely necessary to add that his work is well done.

The disposition to endow a formula with a wealth of functions has nowhere been given freer swing than in the treatise by FRANKLAND and JAPP. With such a text-book chemistry can be made to serve very well in the place pure mathematics has held as a disciplinary study. There is an abundance of abstract thought, and of calculation with concrete instances of practical value. It is well up with the newest chemical work, being the only book on our list that mentions the fact that ozone by extreme cold and pressure has been condensed to an indigo-blue liquid. Much is expected of Prof. Frankland on the subject of water analysis. The reader will find an orderly presentation of the best known facts about the impurities of potable waters, standards of purity, and the significance of various contaminations, but he will be disappointed if he looks for detailed instruction in the latest methods of sanitary examination. We wish that here, at least, the authors had adhered less

strictly to their plan not to impart definite knowledge in this or any other branch of applied chemistry. The medical student will need some other work to serve him in his pharmaceutical, toxicological, or sanitary studies.

For an ordinary laboratory course in inorganic analysis, such as some colleges provide for first year students, CLOWES will do certainly as well as any book now in use. It has grown with the experience of a practical teacher, and uses methods approved for accuracy and easy execution.

The work of DR. SIMON has more especial reference to professional life, and in its organic section covers the important clinical field of urinology. It has a unique feature, which would be of service to a self-taught beginner, namely, the hand-painted plate showing the color of precipitates. Perfect fidelity has been insured by using, whenever possible, the precipitated chemical itself as a pigment.

The progressive character of chemistry makes the first edition of WITTHAUS betray its age, though only two years have gone by since it was issued. The arrangement of the *paraffins* as hydrides is one discarded by the best of late writers. So small a defect is hardly worth mentioning in commenting on a work so full of good points. None of the philosophic truths of chemistry have been neglected, nor have the peculiar requirements of the medical student been forgotten.

In the methods of quantitative analysis there is shown a commendable sense of the doctor's limited opportunities. For example, having given the method of Dietrich for determining the quantity of urea in urine, the author, as if conscious that most physicians would be repelled from it by the calculations and the graduated apparatus required, gives the less accurate but handy process of Fowler, based upon the loss of specific gravity of the urine after the decomposition of its urea by the hypochlorite of sodium. It resembles Roberts's "differential density" method for sugar, and is so simple that we quote Witthaus's description entire:

"To apply this method the sp. gr. of the urine is carefully determined, as well as that of the liq. sodæ chlorinatæ. One volume of the urine is then mixed with exactly seven volumes of the liq. sod. chlor., and, after the first violence of the reaction has subsided, the mixture is shaken from time to time during an hour; when the decomposition is complete, the sp. gr. of the mixture is then determined. As the reaction begins instantaneously when the urine and reagent are mixed, the sp. gr. of the mixture must be calculated by adding together once the sp. gr. of the urine and seven times the sp. gr. of the liq. sod. chlor., and dividing the sum by eight. From the quotient so obtained the sp. gr. of the mixture after decomposition is subtracted; every degree of loss in sp. gr. indicates 0.7791 gram. of urea in 100 c. c. of urine."

After referring to the fact that the presence of a large amount of chlorine in drinking water serves to indicate that organic impurity is of animal origin, he states: "Indeed, when time presses, as during an epidemic, it is best to rely upon determinations of chlorine, and condemn all waters containing more than 0.015 gram. per litre (one grain per gallon)."

The easy execution of this test by volumetric analysis, recommends it, but to make it a just standard there must be a sliding scale. "One



grain per gallon" might justify suspicion of surface waters, which, if free from pollution, rarely contain more than 0.7 grain per gallon, but deep wells and springs, and some shallow wells in unpolluted alluvial soil, often contain as much as 2 grains per gallon, although entirely free from organic contaminants. To make this test available, it is important to know the normal purity of the water supply of the given district, and take that as a standard.

If a sample contains chlorine below the average, or normal in amount, it is highly probable that no sewage has polluted it. An excess would mark the source as suspicious. It would be wise to suspend its use or boil the water before using, until the ban has been removed by a better opinion of it from expert examination for organic matter.

Another significant test of easy application is stated by DR. BARTLEY to give some idea of the safety of a drinking water. The reagent is diphenylamine dissolved in an excess of sulphuric acid. This solution is to be added to the suspected sample previously acidulated with sulphuric acid. A deep blue color indicates nitrites and nitrates. This test, connected with the names of Martin and of Kopp, is not so sensitive as Warrington's, with sulphanilic acid and hydrochlorate of naphthylamine. If a water responds with the blue color, it is certainly to be suspected of impurity. A better process for it than that given by Dr. Bartley, is to add the reagent to the suspected water by means of a pipette, allowing it to flow down the inclined side of the tube and collect at the bottom. A blue belt will form at the junction of the two liquids. Performed in this way the test is more certain as well as more sensitive.

Part first of Dr. Bartley's book contains a digest of chemical physics, very good in its way, but some of it is given up to such simple physical truths as are taught in respectable grammar schools, and some deals with optical and acoustical relations commonly considered in physiological study.

The author has had much experience as a medical teacher, and by that light he may find justification for taking nothing for granted when it comes to the student's previous scientific training. If some of this part were relegated to the writers on physiology, there would be more space for those applications of chemistry to bedside investigations, in which the book is deficient.

Chemical physics makes up the earlier chapters of FOWNES' classic treatise, which has no pretension to being medical, and, hence, is not open to the same criticism. It has been dealt with by Mr. Watts in a style that joins fitly to the perspicuous treatment of the older parts. It all wears Fownes' familiar shape, but it may be questioned whether Fownes' ghost would claim any part of it, so great a change of detail has been wrought by the incessant progress of science. It is still a classic, so far as a work of science can be called classic, because for several decades it has had the painstaking revision of men among the ablest of their time. Thus it has been kept in the category of works distinguished for correctness, completeness, and purity of diction.

Different from it in plan, and quite as acceptable to the medical and pharmaceutical student, is ATTFIELD'S well-known book. It is like Fownes', in that it is a good book to keep after college life for reference,

and superior to it as a manual for the laboratory. It has qualities that fit it especially for the needs of a pharmacist.

DR. WOLFF's book has an arrangement of material different from any other in our language. In his preface the author acknowledges indebtedness to various writers of distinction, in English and in German. It will be seen that this novel arrangement has been modelled after that of Ludwig, of Vienna, in his *Medicinische Chemie*. A capital one it is, to supplement the deficiencies of systematic works. It deals especially with the analytical processes of toxicology, and of physiological and hygienic chemistry.

It assumes on the part of the reader some knowledge of the chemical elements and of chemical philosophy. Intended for a laboratory manual, it is scarcely a fault in the style, that it is too much condensed to be considered easy-going English. It is very "business-like" in character, apparently depending upon the *viva voce* explanations of the teacher to clear up obscure points. The matter is brought down to date, and includes the ptomaines, or cadaveric alkaloids, the basic principles generated during putrefaction. These principles have peculiar chemical interest, because they closely resemble in their reactions and physiological effects various toxic vegetable alkaloids, as atropine, strychnine, digitaline, coniine, nicotine, and morphine. According to Brieger, the nature of the poison depends upon the character of the soil in which the bacillus of putrefaction grows. In chemical behavior they are so much like the vegetable group, as to throw doubt upon the certainty of detection of poisoning from the latter. A test once depended on, namely, their power of reducing potassium ferricyanide to the ferrocyanide will not answer for all, as some vegetable alkaloids give this reaction, and all the ptomaines do not.

In his appendix Dr. Wolff gives a summary of other distinctive features which have the sanction of Brieger and Ludwig, and which hold out the prospect that the expert analyst may yet differentiate them with certainty. He says:

"Those resembling strychnine, however, are not crystalline (at least not yet so obtained) and are not as intensely bitter as that vegetable alkaloid. Those giving the veratrine reaction lack its physiological effect, while that apparently analogous with digitaline fails to give a reaction with sulphuric acid and bromine, the cadaveric morphine does not give the blue color with ferric chloride, like vegetable morphine, and the mydriatic ptomaine fails to give the characteristic odor produced by atropine when heated with sulphuric or phosphoric acid."

The use of the plural form would seem to imply that there is more than one ptomaine resembling strychnine, and more than one resembling veratrine. No authority is cited to sustain this, but from the construction of the summary in the paragraph, it appears to be an abstract from Ludwig (*Medicinische Chemie*, p. 346, 1885).

The German writer refers to all but the digitaline-resembling ones with the article, noun, and verb in the singular, as "Das dem strychnin ähnliche ptomain," etc. In other paragraphs concerning them, Ludwig refers to each in the singular number, except the digitaline-resembling ones. Considering the fact that it is a first edition, and that it freely uses formulas and volumetric computations, Dr. Wolff's book is remarkably free from

errors. The verbal inaccuracies occasionally seen are apparently due to hasty proofreading and do not materially affect its usefulness.

It is an excellent compend for the second year student and practitioner. The author has read widely, and given his best efforts at collecting handy, yet accurate, analytical reactions mostly for volumetric tests for poisons, the constituents of animal fluids, and adulterations of food.

J. W. H.

#### RECENT SYSTEMATIC WORKS ON SURGERY.

THE SCIENCE AND ART OF SURGERY. By JOHN ERIC ERICHSEN, F.R.S., LL.D., F.R.C.S. Eighth edition. Revised and edited by MARCUS BECK, M.S. and MB. Lond., F.R.C.S. 8vo. 2 vols. pp. 1124, 1205. Philadelphia: H. C. Lea's Son & Co., 1884.

THE PRINCIPLES AND PRACTICE OF SURGERY. By JOHN ASHHURST, JR., M.D. Fourth edition. Enlarged and thoroughly revised. 8vo. pp. 1118. Philadelphia: Lea Brothers & Co., 1885.

"THE favor that has for so many years been shown by American surgeons to the 'Science and Art of Surgery'" (a favor that Mr. Erichsen so highly compliments us in regarding as "the most honorable distinction that could be conferred upon it") makes it necessary, in noticing a new edition, to have regard only to the author's views upon those questions of pathology and treatment that have especially engaged the professional mind during the last ten years.

The demonstrated influence of organized ferments and irritants in the production of local and general changes and the development of special surgical affections is duly recognized. As a consequence, the chapters on *inflammation* and its complications have been in large measure rewritten and much extended, care being taken clearly to distinguish between what has been proven and what is but inferential and probable.

The value of the "antiseptic method" ("that has revolutionized the practice of modern surgery") and the propriety of using an antiseptic dressing are repeatedly and strongly insisted upon. The various germ-destroying agents in common use are treated of. *Carbolic acid* is "the most convenient antiseptic for cleaning the surgeon's hands and instruments and washing out the wound;" "in open wounds with loss of substance, which cannot be treated by rigid antiseptic methods, such as those resulting from operations on the anus or rectum, or from excision of the tongue or jaw, the direct application of *iodoform* to the raw surfaces is of the greatest possible use, and is the best method of treatment at present known," though such application "to the raw surfaces of fresh wounds before closing them" is not recommended, being "a needless introduction of a foreign body;" *boracic acid* is "one of the less powerful, and at the same time one of the least irritating of chemical antiseptics;" *salicylic acid*, possessing no toxic properties, "in this respect presents advantages over carbolic acid;" *corrosive sublimate* (noticed in an appendix to the second volume), "a most powerful and efficient antiseptic . . . capable of being safely used in the treatment of wounds, is locally irritating, and generally poisonous, and, as it possesses these properties in a



higher degree than most others, a corresponding degree of caution is necessary in the preparation of the solution and dressings, and in their use." The spray apparatus, an instrument "which can most readily be spared," because of giving great and additional security, had better be used "during the early treatment of a large chronic abscess," and "in all cases in which cavities are opened, . . . especially if the cavity is one in which putrescible matter is likely to accumulate, and which it is impossible thoroughly to cleanse or drain; thus it is of great use in small openings into the pleura, abdomen, or joints."

When the surgeon can secure the "more complicated chemical and surgical appliances . . . which are essential to the success of many modern methods of treatment, let him by all means use them . . . but let him remember that wounds were healed safely, speedily, and well before they were invented. . . . If he is not in the land of spray-producers, protectives, and guards, of iodoform and salicylic acid wools, let him not despair, cold water and clean linen rags will do much to supply their place." In the treatment of abscesses "in the absence of all antiseptics, decomposition may be reduced to a minimum by securing perfect drainage, by free incisions and tubes, so as to reduce the decomposable matter to the smallest possible quantity; and by avoiding the use of water, both during the opening of the abscess and afterward."

In the chapter on gunshot wounds it is directed that "above all the surgeon must avoid that most pernicious practice of exploring the wound with a grimy finger or unclean probe, thus at once and with certainty infecting it to the very bottom." Would that it were possible to fix this principle in the minds of all who have to do with this class of injuries in civil as well as military practice.

In the chapter on *head injuries* there is not to be noticed any material change in the author's views as previously expressed; but much has been added in reference to both pathology and treatment. The subject of cerebral localization is discussed at considerable length, Lucas Championnière's rules for the application of the trephine being given, and diagrams introduced showing the position of the fissure of Rolando and the adjacent motor-areas.

In the subsection on foreign bodies in the windpipe, Dr. Weist's paper, "a study of 1000 cases," read before the American Surgical Association, at its Philadelphia meeting in 1882, is twice referred to, the author's name appearing as West. Extirpation of the larynx, that in the previous edition (when it had been made only for cancer) was a "barren triumph of surgical skill," now has in it "some prospect of advantage . . . especially when the disease is recognized early and is intrinsic, and more especially if it is sarcomatous. In extrinsic malignant disease it is very doubtful whether it is a justifiable procedure. . . . Laryngectomy, indeed, appears to offer no advantages over tracheotomy in such cases."

In penetrating wounds of the abdomen, when there is no clear evidence that the intestine has been injured, laparotomy is not favored; and is but hesitatingly approved when "no doubt exists as to the intestine being wounded." When the bladder is ruptured, the wisest plan of treatment is thought to be "to drain by means of a large soft catheter, through which the peritoneum may be washed out antiseptically; should this not be practicable through the urethra, then lateral perineal cystotomy should be done, with the double effect of securing perfect drainage, and enabling the surgeon to wash out freely."



As might have been expected, material change has been made in the chapters on *diseases of the abdomen*, since "in no department of surgery has there been a greater advance during the last few years than in the operative treatment of diseases of the abdominal and pelvic viscera." Several pages have been added on the "special dangers common to all abdominal operations, and the principles which guide us in avoiding them;" and due notice is taken of removals of portions of the intestine (*enterectomy, pylorectomy*), of gastro-enterostomy, of operations upon the liver and the spleen. What were a few years ago simply "surgical audacities," are now legitimate and proper operations. Recognition is made "of the merits of those surgeons who boldly and skilfully have led the advance in this department of our art, and of the vast importance of the results thus achieved by them;" though a caution is given that "an operation is not necessarily justifiable, because it is practicable—that every act of operative audacity is not a triumph of sound and legitimate surgery—and that a patient's life may possibly be prolonged on conditions less tolerable than death."

The extensive operations that in the last few years have been made in cases of cancer of the breast, operations that have "so far been attended with the most satisfactory results," are duly noticed; and many a patient in England and this country may have to thank Mr. Erichsen for the statement that "better results have of late been obtained by free removal of the affected gland with the surrounding skin and the axillary glands."

Rapid lithotripsy (litholapaxy), introduced into surgical practice since the appearance of the edition of 1878, is stated to constitute "an immense and most important advance in lithotripsy . . . and its universal adoption by lithotritists is the best evidence of its utility. It makes lithotripsy applicable to numerous cases, which, under the older and more slowly conducted system, were not adapted to and could not be safely treated by it."

Everywhere examination of the present edition shows that there has been thorough and careful revision, and that no labor has been spared to make the work a real epitome of surgery, in which may be found correct pathology, clear descriptions, and judicious counsel.

As with "Erichsen" so with "Ashhurst," its position in professional favor is established, and one has now but to notice the changes, if any, in theory and practice, that are apparent in the present as compared with the preceding edition, published three years ago.

The "germ-theory" and the resulting "antiseptic treatment" of surgical diseases and injuries are held in no higher esteem than before; "the alleged superiority of the 'antiseptic method'" is still "as yet" undemonstrated; and it is declared that "the results obtained by Prof. Lister and his followers are, as far as I have been able to trace them, at least no better than those met with by careful surgeons who employ simpler dressings; and, on the other hand, serious symptoms of poisoning and even death have not unfrequently followed the use of carbolic acid in this way, while the fashionable antiseptic of the moment—corrosive sublimate—has killed at least 22 patients, no less than 7 of these having died in a single American hospital." Even in treating of erysipelas, no mention is made of its microörganism, which has not only been discovered, but cultivated and successfully inoculated upon the human subject.

In the treatment of wounds and lacerations of the abdominal viscera,

laparotomy, with after-applications of ligatures and sutures, is not regarded with much favor, as "it would but add to the patient's danger," or "the prospective benefits of such a proceeding would, it seems to me, in most cases be questionable, while the additional risks that it would entail are manifest." The favorable result of laparotomy in certain cases of peritonitis is referred to. In bladder-rupture cystotomy, "as in the median or lateral operation for stone," is thought "preferable to opening the bladder either through the rectum or above the pubes," and suturing the bladder does not seem to be approved.

Of the propriety of laryngectomy, the author expresses himself as regarding Dr. Cohen's conclusions as "well founded; that while the operation may be justifiable in exceptional cases in which the disease is limited in extent, the greatest good to the greatest number will be promoted, as a rule, by declining attempts at extirpation, and being content with tracheotomy and other palliative measures."

Pyloric and cardiac gastrectomy are, as before, looked upon as operations "hardly within the pale of legitimate surgery." A table of the cases of removal of the pylorus, numbering 84, is given, as also are tables of nephro-lithotomy, nephrectomy, splenectomy, and cholecystotomy. Statistical tables of operations of various kinds in the present as in previous editions are numerous, and add not a little to the value of the work as one of reference.

Though neither many nor great changes have been made in the present edition, the work has been brought well up to date; and larger and better illustrated than before, its author may rest assured that it will certainly have a "continuance of the favor with which it has heretofore been received."

P. S. C.

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THE INSANE IN THE UNITED STATES AND CANADA. By D. HACK TUKE, M.D., LL.D., F.R.C.P. London. 8vo. pp. 264. London: H. K. Lewis, 1885.

FOR one hundred years the name of Tuke, in England, has been identified with movements calculated to promote the best interests of the insane, with their professional care, or with the medical literature of insanity. The volume before us is by Dr. D. Hack Tuke, well known in this country as joint author with Dr. Bucknill of *A Manual of Psychological Medicine*, and in the line of *Chapters in the History of the Insane in the British Isles*, by the same author. The volume comprises five chapters. The first is devoted to a biographical notice of Dr. Rush—a central figure in the history of American medicine—and to the early lunacy practice in the United States at the period when Dr. Rush published, for the benefit of his pupils and the profession, *Observations on the Diseases of the Mind*, in 1812, six months preceding his death. Considered in the light of the experience of that day, this volume may be regarded as a compendium of the knowledge of the foremost member of the profession of the treatment of the insane in this country, and the history of the medical care of the insane may be said to date from the publication of Dr. Rush's book.

If the remedies of Dr. Rush consisted of bloodletting, blisters, issues, salivation, emetics, purges, and a reduced diet, it must be remembered

he lived at a period in the history of medicine when similar remedies were in use in general practice as well as in asylums, and when the practice of medicine was of the most empirical character. It is hardly probable that the early lunacy practice in America at the time Dr. Rush lived, differed materially from that which prevailed elsewhere, and even he may have been impressed and influenced by what he had been taught and observed in England and Edinburgh, from what appears from the testimony furnished a committee of the House of Commons. The physician of Bethlem stated in 1813: "Twice a year, with few exceptions, the patients are bled, and after that they take vomits once a week for a number of weeks, and after that we purge them." Dr. S. Tuke, in his *Description of the Retreat*, York, 1813, is disposed to think the advocates of this treatment were governed by a principle or philosophy, as he observes: "This plan of treatment (depletion) appears to be founded on the supposition, that irritation or violence proceeds universally from a plethoric habit, whereas I think experience clearly contradicts this opinion;" and Dr. Rush prescribed bloodletting as the first remedy in mania, because of the "importance and delicate structure of this organ (brain), which forbids its bearing violent morbid action for a length of time, without undergoing permanent obstruction or disorganization."

Dr. Tuke says of Dr. Rush:

"What I should claim for him would be, that he distinctly recognized the corporeal nature of insanity; that to his students and in his writings he taught, that it is a disease that must be submitted to medical as well as moral treatment; and further, that he gave to the profession and to the world, an able exposition of the forms of mental disease."

Dr. Tuke might have added that Dr. Rush lectured to his pupils upon insanity, and, for all we know to the contrary, was the first to impart instruction in this manner upon this branch. As a further contribution to the history of the medical treatment of the insane, and as foreshadowing the change that was about to take place, Dr. Tuke states his father addressed a letter to the governors of the New York Hospital in 1811, in which he writes: "General bleeding and other evacuants have been found injurious at the Retreat (York), and are therefore not used except where their necessity is indicated by the state of the bodily habit." It is quite probable bleeding and depletion were abandoned at York, and to a certain extent in the hospitals of Paris, under the control of Pinel, as early as 1798, and that the reaction against the principles of Dr. Rush subsequently gained ground among his countrymen. Passing to a later period when a number of asylums had been established and some valuable experience gained, Dr. Tuke quotes from Dr. Bell, of McLean Asylum, in his report for 1841: "No individual at the head of an insane institution would now think of combating any form of insanity, with depletory and reducing means, once regarded as indispensable." Reference is made to the testimony of Drs. Wyman (1821), Kirkbride, Todd, Brigham, White, Ray, and Cürwen (1852), among the earlier American physicians, against bleeding, purging, and low diet, and in favor of tonics and generous diet. It may be safe to assert that for more than sixty years, bloodletting and similar measures have been abolished in asylum practice. Twenty-five years ago it was a common occurrence to receive patients into the hospitals who had been bled, and within thirty years bloodletting was occasionally resorted to in general hospital practice.



We cannot leave this chapter and the notice which Dr. Tuke furnishes of Dr. Rush, without adding the fact that his recommendations for the humane care of the insane, their moral management and treatment, their occupation, were in advance of his day; and that his pronounced views of the evils of intemperance, and suggestions for the creation of establishments for the custodial care of inebriates, have led the advocates of temperance to look upon him as one of the earliest promoters of their cause, to make pilgrimages to the Pennsylvania Hospital to behold his portrait, and to the place of his interment, as to a shrine.

The second chapter is devoted to "Provision for the Insane in the United States from 1752 to 1876," a period during which seventy-six State and municipal asylums and hospitals were established. A brief historical notice is presented of some of the earlier efforts to make improved public provision for the treatment of the insane, which seem to date from a petition sent by private citizens of Philadelphia to the Provincial Assembly in 1751, for a charter to enable them to found "a hospital for the reception and relief of lunatics and other distempered and sick poor." The humane sentiments incorporated in the act creating the Pennsylvania Hospital were announced forty years before the movement of Pinel, and have such an important bearing on the history of this subject in this and other countries, that we regret Dr. Tuke did not give this historic fact more prominence, and even reproduce the language of the entire preamble of the charter. Dr. Tuke makes appropriate reference to the work of Miss Dix. No complete history of provision for the insane in the United States could be prepared without an acknowledgment of her lifelong devotion to the interests of the insane, or a recognition of the influence exerted by the late Dr. Kirkbride, and the Association of Superintendents of Asylums, upon the plans for construction of new hospitals and their organization. While Dr. Tuke does not offer any opinion or observations upon the prevalent system of asylum construction referred to in this chapter, it must be conceded it was tending toward decided extravagance in plans and administration during the last decade of the period, and that the reaction that followed greatly retarded the completion and erection of new buildings. Several quotations are produced from published reports on the condition of the insane in poorhouses, but the comments and allusions are not in the language that might have been used had this independent and fearless observer written of the wretched almshouse system of this country after personal observation.

The succeeding chapters are devoted to the "Present Condition of the Insane in the United States; Principal Asylums Visited; and the Insane in Canada." Thirty asylums in the States of New Hampshire, Vermont, Massachusetts, New York, Connecticut, Rhode Island, Pennsylvania, New Jersey, Illinois, Wisconsin, Maryland, District of Columbia, and Canada were visited, and the observations and comparisons of such a critical and trained observer will receive respectful consideration on this side. Under the head of "General Management and Treatment," reference is made to the use of mechanical restraint and medical treatment. A table is presented showing that the number of patients in asylums in 1880 was 40,992, of which 2242, or five per cent., were alleged to be under restraint of some kind, including 21 with a chain and ball! The authority on which this extraordinary statement was made is not given, but we have read it with surprise and doubts as to its correctness. If



it was true then, we have no hesitation in observing it was discreditable to the management of our asylums; but, as Dr. Tuke states, "it would be unfair to take these figures in giving a correct representation of the amount of restraint at the present time." It is well understood that differences in practice, honestly but mistakenly entertained, have existed in the English and American asylums. While restraint has been sparingly used, or wholly abolished in many American asylums, and its use openly advocated and supported in the public reports and discussions as a beneficent and even humane measure, it has been demonstrated in the English and Scotch asylums that it may with great advantage be wholly abolished. It would have been more creditable to our American brethren had they met the question with a different spirit—frankly admitted and studied the embarrassments surrounding them, than to have maintained the indefensible position of supporting a system constantly liable to abuses, and lowering the standard of care. To illustrate, Dr. Tuke, in referring to the use of the covered bed, called the "crib," observes, "that, whatever its occasional utility may be, it may be abused will be admitted when I say I counted fifty in use in a single asylum." Better would it have been for our own asylums if so many of the pilgrimages made for the purpose of observing foreign asylums in recent years had been taken at an earlier period. Whatever may have been the public expressions and sentiment of our superintendents in this respect in the past, we are glad to bear our testimony that they have been individually reforming their practice and persistently dispensing with mechanical restraint. Non-restraint in asylum practice has come to mean the substitution of a higher quality of personal attendance, the controlling influence of moral and mild measures, and a higher training of attendants, for mechanical measures and architectural devices. This result, with the attendant accompaniments of an improved system, has been, to their credit, honestly attained by the Scotch and English physicians.

"With regard to the strictly *medical* treatment of the insane, I do not think there is much if any difference between the American and English practice." "It is not so common a practice there (America) as here (England) to employ one or two attendants to take a maniacal patient out into the grounds and allow him to work off his excitement by exercise." Dr. Tuke notices the subject of *recoveries*, which are variously reported at twenty and forty per cent. of admissions, which is a close approximation to the English results; the *mortality*, which ranges from five to seven per cent. of the average number resident, a lower rate than prevails abroad; the alleged difference in type in the *form or intensity of mental disorders* in the two countries, concluding that it does not exist: the *employment* of the insane in asylums, which is less in amount and variety than in English asylums; the care of *suicidal* cases, which are usually placed in dormitories with non-suicidal patients subject to calls from the night-watch, while in England the approved practice is to place such patients in dormitories under the eye of a night attendant in the same room; the care of *epileptic* patients, who are not congregated in dormitories, according to the frequent and approved practice in England, but usually assigned to single rooms; the infrequency of *general paralysis* in American as compared with English asylums, though it is clearly on the increase and bids fair to equal the amount witnessed in the mother country; the dissimilar *lunacy legislation* of nearly fifty States, with what we regard an unfortunate tendency to more stringent laws for admission;

and the *inspection* of asylums by State boards created in thirteen States, in which the author might have recorded the fact that the asylums where such boards had been created showed the greatest evidence of progress and tendency to advancement.

Several pages of this book are devoted to a notice of the attempt to "grapple with the problem of chronic insanity," which has proved as difficult of solution in this country as in England. Insanity has increased faster than the ability and willingness of States to build hospitals to meet the requirements. The creation of the Willard Asylum, in New York, in 1869, of the asylum at Kankakee, Ill., in 1883, the detached system of buildings at Norristown, Washington, Jacksonville, and Middletown, Ct., and the improved county asylum system of Wisconsin, are examples of efforts to care for the chronic, and the acute and chronic insane. They mark a departure from previously existing plans which is likely to impress itself upon buildings for the insane in the future. Dr. Tuke remarks, "I may state that, although not a few in the States look with a critical eye at what they regard as segregation run mad, the principle itself, that of providing many small buildings in place of a large one, is rapidly advancing in the United States."

Among the relative merits of American asylums, Dr. Tuke notes the many ingenious devices which inventive Americans have suggested for the good working of their institutions, which English superintendents might usefully imitate; the greater number of medical men in asylums, and the possibility at least of more individual interest in patients; the appointment of lady physicians, which must yet be regarded as an experiment which "we ought to be grateful to our friends across the water for making," "at the same time I am afraid it must be confessed that the results are but scanty, and fall far short of what had been anticipated from the particular attention thus paid to this department of practice (uterine affections in their relation to insanity), under, as I consider, very favorable auspices;" "and the superior dietary and warming arrangements—the Americans not only feed, but house and warm their patients better than we do." As to the demerits, he doubts the propriety of mixing the paying and non-paying patients; the lack of employment and occupation; the generally bare, unfurnished condition of wards occupied by excited patients; the amount of restraint in use; and closing, "I would say that the outlook with regard to the future of the insane in the United States is very encouraging."

Those of our readers who are desirous of learning the impressions and conditions of the thirty asylums as they appeared to this capable and painstaking observer, will be repaid by a perusal of this book. One hundred and forty-four pages are devoted to detailed descriptions of the asylums visited, which are remarkably correct. Favorable notice is made of the asylums in the Province of Ontario, but the author indulges in the severest criticisms of the condition of the Beauford Asylum, Quebec, and the asylum at Longue Pointe, Montreal.

It is not our province to notice many of the merits and demerits of both the English and American systems which our author has omitted to embrace in the scope of his work. Each may gain from the other by personal examinations in the kindly and fair spirit which he has shown. As a record of steady progress of provision made for the care and treatment of the insane, it is the most complete book yet published in England, and one that no thin-skinned American need be afraid to read. J. B. C.

ACNE; ITS ETIOLOGY, PATHOLOGY, AND TREATMENT. A PRACTICAL TREATISE BASED ON THE STUDY OF ONE THOUSAND FIVE HUNDRED CASES OF SEBACEOUS DISEASE. By L. DUNCAN BULKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital, etc. 8vo. pp. 280. New York and London: G. P. Putnam's Sons, 1885.

THIS treatise, embracing in its scope merely a single group of cutaneous diseases, has been written with a care and completeness sufficient to furnish a good abstract of what is actually known on the subjects considered. We should expect no less of it. The field is not a very wide one, nor are the problems it presents of great gravity. What is more or less generally acknowledged to be practically useful in the management of the disorders under discussion, is here set down. Without pretense to much originality, and with a fairly broad survey of the literature of the theme, the pages before us contain details covering the facts and inferences established by the best writers on the disorders of the sebaceous glands.

The original drawings which serve to illustrate the pathological studies on which portions of the book are based, deserve special commendation. For these the author gives large credit to Drs. George T. Elliott and Edward Preble, who also contributed their share to the full and excellent bibliography appended. Similarly careful and scholarly work can be recognized in the "Synopsis of the Classification of Sebaceous Diseases by Writers on General Medicine and Dermatology," which latter occupies seven closely printed pages.

It is, however, to be regretted that by the prominence given to such terms as "*acne sebacea*" for *seborrhœa*, and "*acne molluscum*" for *steatoma*, a contribution should be made to the existing confusion respecting proper dermatological titles, one of the chief obstacles to a more general study of cutaneous medicine. It may be noted, however, that in the face of these and similar attempts, year after year, the profession in general are more fully adopting the nomenclature sanctioned by the American Dermatological Association.

Touching the treatment of *acne rosacea* and *miliun*, the author states that "Hardaway has advised electrolysis," and "electrolysis has been recommended for the purpose (Hardaway)" (pp. 127 and 227). This suggests that Dr. Bulkley does not habitually employ the measures designated, and is ignorant of the fact that scores of physicians in this country are, every day, employing with the most brilliant success, electrolysis for the removal of the telangiectases of *rosacea*, and of the small lesions represented by *milia*, *verruca*, etc. Compared with the results thus readily obtained, the method recommended in *rosacea* of "slitting each dilated capillary with a sharp knife, and then by means of a sharp-pointed stick of nitrate of silver cauterizing the wound," seems both clumsy and ineffective.

There are, however, two main defects in the work; one of less, the other of greater importance. The first is the distinct tendency of the author, exhibited here as in some of his other contributions to medical literature, to enlarge upon points only remotely, if at all, connected with the subject under discussion. If one will consult the concisely written pages of any good modern text-book on cutaneous diseases relating to the sebaceous glands, and take the trouble to read at the same time any equally good modern hand-book on hygiene he will have a very fair



idea of the present work. Dr. Bulkley, for example, devotes no less than three pages to a consideration of milk as an article of diet, and is here betrayed into a somewhat amusing confusion of terms by announcing that "it (milk) should be drunk alone."

A more serious error is, it seems to us, betrayed in his omission to recognize the essential character of a large number of cases of acne and disorders allied to it, that come under the observation of the physician. To these belong the acne-hypochondriacs of both sexes, morbidly conscious from morning to night of a slight facial efflorescence, tireless students of the pictures presented in their mirrors, the fingers persistently playing over the features, shrinking from the gaze of others like social Pariahs, ripe for the hand of the too zealous practitioner, types of the gross and demoralizing self-absorption which is the worst product of our selfish age. To this class belong also the men and women of unimpaired health who can be persuaded to undergo treatment for a disease which is really self-limiting and actually should be untreated.

Our author betrays, however, an instinct for treatment of all cases, that makes his book consistent from beginning to end. Though entitled, "Acne, its Etiology, Pathology, and Treatment," every alternate page is headed "The Treatment of Acne." He teaches (p. 157) that "acne simplex may be regarded universally as a result of debility in some form," a statement that should not be allowed to pass unchallenged. Every one knows that men and women who are, as a matter of fact, slowly dying of incurable disease, have complexions that are, viewed from the standpoint of artistic beauty, exquisitely perfect; and there are hundreds of rugged farmers and farmers' daughters in the country, possessed of a fair share of common sense, who will laugh at the suggestion that their facial acne arises from "debility in some form"! Our author would place them all in the category of "patients" for treatment. "In certain cases," he says, "it would seem impossible to do more than to keep the skin free from annoying lesions by persistent treatment, not only till puberty has become well established, but until the age of twenty or twenty-five has been reached" (p. 167). He would even order "an alterative course with a little bichloride of mercury" (p. 160) in certain cases. In yet others, a bath may be employed, which "can only act by stimulating the skin to perform its functions more normally."

"More normally"! The phrase embodies the very essence of the fault described. It might serve for the shibboleth of every medical myope, for the physicians—unfortunately too many—who cannot rise above the poor level of mere prescribers of drugs. Compare for a moment the youths treated for an acne, "not only till puberty has become well established, but until the age of twenty or twenty-five," with the class represented by that young man, Marquette, who, dying of consumption, pushed his way through an unexplored wilderness to the Mississippi; or that other young man, Kane, who, despite his disease of the heart, braved the dangers of an Arctic winter! The diseases of the sebaceous glands truly do not belong to a family that kills. If the great Cæsar had dallied in Rome to be treated for the seborrhœa of the scalp that left bald the vertex of his imperial head, it may well be doubted whether he had ever conquered Gaul!

All said, however, Dr. Bulkley's book may be regarded as a useful and valuable addition to the literature of the subject upon which he has written at such length. The typography and proofreading are of the best.

J. N. H.



## CLINICAL LECTURES.

ON SCROFULOUS NECK. By CLIFFORD ALLBUTT, M.A., M.D. Cantab., F.R.S., F.R.C.P.

ON THE SURGERY OF SCROFULOUS GLANDS. By T. PRIDGIN TEALE, M.A., M.B. Oxon., F.R.C.S. 8vo. pp. 32. London: J. and A. Churchill, 1885.

THERE are many ailments to which the human frame is liable which trench upon the departments both of medicine and surgery; and while it must never be forgotten that the careful surgeon will pay attention to the medical aspects of the cases under his care, there is much advantage in having the same subject treated from a medical and surgical point of view by men as eminent in their respective branches as these two well-known lecturers of Leeds.

Scrofula is one of those diseases which, often starting under the care of a physician, is, when developed, turned over to the surgeon as an external affection, although it has until lately received little but expectant treatment at his hands. But to Dr. Allbutt, a few years since, there presented itself the idea that the disintegrating scrofulous gland was an evil *per se*, exerting an evil influence upon its owner, and that when possible it should be removed. This radical measure, for it is far more than a mere evacuation of pent-up matter, has been, perhaps, thought of, and in some cases acted upon, by others, but was brought prominently into notice at the London International Congress by the recorded experience of the authors of these lectures. Indeed, these lectures, and especially the one by Mr. Teale, are but little more than an enlargement and reiteration of the views then expressed.

In the first one Dr. Allbutt, with many rhetorical flowers, makes clear his opinions upon the etiology and pathology of scrofulous neck. While not denying the existence of an inherited vulnerability of tissue, he is disposed to look upon scrofula as often a "deflection" from the normal, induced by external causes, under the influence of which an inferior healing power is manifested. The external causes are poor hygienic surroundings, under which the initial lesion is instituted and its continuance maintained. Chief among the primary affections thus induced, is what Dr. Allbutt speaks of as drain throat, being a pharyngitis produced by exposure to sewer gas, to which he thinks the rich are quite as much exposed as the poor, and which, in his judgment, accounts for the many scrofulous necks among those whose surroundings are otherwise excellent. Be this as it may, there can be no question that enlargement, and ultimately caseation of the cervical glands, is a frequent sequence to suppuration of the throat, and the indication is very clear to treat promptly and efficiently all such cases, and especially if the patient is one whose reparative powers are below the normal.

Dr. Allbutt calls particular attention to the importance of searching diligently for a peripheral irritation whenever glandular enlargement is noticed, pointing out that glands do not enlarge of themselves. We believe that if more close scrutiny were bestowed upon these cases, and were the well-known fact to which our author refers more constantly borne in mind, there would be many more cases in which, by the removal of the irritating cause, the early enlargement of the glands would

diminish and disappear; whereas if allowed to go on to caseation, unless the radical measure recommended in these lectures is resorted to, there remains nothing but long-continued suppuration, often leading to great, if not fatal, impairment of health. The evils of enlarged glands allowed to pursue their natural course undisturbed are threefold: A tedious malady attended by disfigurement; such an impairment of the general health as injures the patient's usefulness and enjoyment, and in many cases the inoculation of the system with the elements necessary for the development of phthisis.

For the avoidance of these evils Dr. Allbutt and Mr. Teale, with an increasing number of other practitioners, advise an early removal of the diseased glands; and their experience with the proceeding has been most favorable, resulting in comparatively speedy recovery from the operation, and great improvement of the patient's health.

Succinctly, and with most easily understood conciseness, Mr. Teale narrates his experience with the operation, and gives admirably suggestive hints for its proper performance. Mr. Teale illustrates his opinions by the same series of cases, watched to a conclusion in private practice, which he presented to the International Congress of 1881, merely adding that further experience has abundantly confirmed the views then expressed. Those views are, that wherever septic material exists in the system it should be removed; that in a majority of cases of enlarged cervical glands there is no evidence of constitutional taint, and that, therefore, surgical interference is demanded (*a*) whenever a sinus resulting from a degenerate lymphatic gland exists; (*b*) when pus is found connected with an enlarged lymphatic gland, or (*c*) when accessible glands exist in a patient in whom a caseous or suppurating gland has been found. When glands, which have not suppurated or undergone caseous degeneration, are an eyesore, or accompanied by ill-health, the question of their removal is an open one; but Mr. Teale inclines to think that in many cases "cautery-puncture," recommended by Treves, is the proper treatment, although he has had no personal experience with the measure.

Mr. Teale formulates several conclusions as to the surgical treatment of these cases. He thinks that surgery can secure the prompt healing of gland cavities and sinuses connected with them if the treatment is vigorous and thorough. His experience has taught him, as it has others, that the visible abscess is very often a mere collection of pus dependent upon a degenerate subfascial gland, which it is futile to incise unless the underlying gland is gotten rid of. Mr. Teale insists that when extirpation is resorted to, before the skin has become thinned, the wound heals well and with an insignificant scar, but that it is apt to be depressed if the operation has been long deferred, and resorted to only when there has been an open sinus discharging for months or years. When a sinus exists it should be dilated by a "Bigelow's dilator," its surface scraped, and any overhanging thin skin removed by scissors; but the surgeon should not rest until he has searched for and found the cause of the mischief—the degenerate gland, which will be often found underneath the floor of the abscess, connecting with it by a small aperture. This opening, often only large enough to admit a director, should be sought for, dilated sufficiently, and the gland scraped away with the spoon. When a gland has not suppurated, and is movable, it can be very easily enucleated, but when it has become caseous the difficulty of its removal is much

increased. In these cases the capsule should be incised and its contents removed by the spoon, the tough living stump of the gland adhering closely to the capsule, and often requiring the very vigorous use of the scraper, when it cannot be dissected away without risk to the adjoining tissues. Sometimes after the capsule is emptied a contiguous gland can be felt impinging upon the cavity. This should be reached by pricking through the wall of the cavity, and removed in the same manner. Having removed the gland or glands, Mr. Teale cleanses the cavity with a carbolized solution and charges it with iodoform. A drainage tube, reaching to the inmost recess, is fastened in, and the wound accurately closed with some absorbent antiseptic substance. When the gland and its capsule have been dissected out, the tube is removed at the end of a week and not replaced, but in other cases, the lecturer thinks, it is best to maintain drainage by a gilt wire kept in position until all but its own track is healed, which will ordinarily be in from three to ten weeks. In this matter of the drainage tube Dr. Allbutt and Mr. Teale are not agreed, the former cautioning against its continued use, as leading to the formation of a denser scar. Mr. Teale prefers Lister's scrapers as very superior to Volkmann's, the cup having a large oval, almost circular shape, and the double curve of the handles allowing the scoop to be swept round a cavity with better effect. Mr. Teale speaks highly of Dr. Bigelow's dilator, constructed on the principle of a glove-stretcher, as a very valuable instrument to enlarge sinuses in regions where the knife cannot be used safely. The remainder of the lecture is occupied with details of cases.

As we have said, the proceeding advocated in these lectures has attracted considerable notice and been adopted by many surgeons. Our personal experience with this mode of treatment has been too limited to enable us to speak with confidence of its merits, but it has been sufficiently satisfactory to lead us to give it a further trial in these cases, which have always been an opprobrium to both medicine and surgery. The proceeding is rational, in careful hands devoid of much risk, and, as recommended by such good authorities as the authors of these lectures, is worthy of an extended experimental test.

S. A.

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A SYSTEM OF PRACTICAL MEDICINE BY AMERICAN AUTHORS. Edited by WILLIAM PEPPER, M.D., LL.D., assisted by LOUIS STARR, M.D. Vol II., GENERAL DISEASES (CONTINUED) AND DISEASES OF THE DIGESTIVE SYSTEM. 8vo. pp. 1312. Vol. III., DISEASES OF THE RESPIRATORY, CIRCULATORY, AND HÆMATOPOIETIC SYSTEMS. 8vo. pp. 1032. Philadelphia: Lea Brothers & Co., 1885.

THE volumes of this great work succeed each other with a rapidity which does credit alike to publishers and editor. The second volume opens with the articles on "Rheumatism and Rheumatic Arthritis," by Dr. R. Palmer Howard, of McGill University, Montreal. The pathology of acute articular rheumatism is still in a most unsatisfactory condition, and as no one of the many theories fully meets the



problem of its origin, the author wisely contents himself with a mere statement of the views of various authorities. The nervous theory of Dr. J. K. Mitchell has again come into favor, and has found a powerful advocate in Jonathan Hutchinson. The author holds that there is in rheumatism more than a simple inflammation set up in an individual of a neuro-arthritic diathesis, and that a considerable part of the phenomena is due to perversion of the processes of assimilation and excretion, and to the presence of some unknown product of destructive metamorphosis. The clinical description of the acute affection is most ably drawn, every detail receiving careful attention, even to the minute subcutaneous nodules. The subacute articular, and the mono-articular, acute and subacute forms, receive separate consideration. In the section upon treatment, the use of the salicylates is discussed at length, and the author's conclusions may be thus summarized. The articular pain and the fever are more or less speedily removed. Relapses are more frequent, probably much more frequent, under this than the older modes; the salicyl compounds do not arrest or control the rheumatic inflammation of the endo- or pericardium, though on this point therapeutists are divided; hyperpyrexia is not always prevented; the average duration of the disease is not very materially lessened—indeed, there is some evidence that the salicylate treatment actually prolongs the time spent in hospital; and, lastly, there are often unpleasant or even serious effects from the use of the drug. In reading this careful analysis, in the preparation of which the whole range of medical literature has been laid under contribution, we confess to a feeling of sadness—another therapeutic dream dispelled! And ten years ago we were full of hope that in the salicylates a specific had been secured. However, we are daily gaining information as to the cases in which the salicylates are really valuable, and ascertaining the causes of failure. Dr. Howard favors a combination of the salicylates and alkaline treatment as likely to give better results than either of the remedies alone. And at the end of the section, after a careful consideration of the complications, a good summary is given of the plan of treatment which should be carried out.

The article on "Rheumatoid Arthritis" contains one of the best descriptions of this disease in its various aspects which has appeared, and will be read with much interest and profit by many to whom rheumatic gout or chronic osteoarthritis in its multiple forms has been a puzzling and vexatious disease.

The sections on "Muscular Rheumatism" and on "Gonorrhœal Rheumatism" are from the same pen. In connection with the latter, it is interesting to note that Fraser, of Edinburgh, has recently called attention to the complete failure of the salicylates in rheumatic cases with mucopurulent discharges from the genito-urinary tract, and alludes to this as an important and often unrecognized cause of failure of the drug.

Dr. W. H. Draper, of New York, writes the article on "Gout," a judicious, well-considered contribution, particularly strong in the section on medicinal and dietetic treatment. We are disappointed at not finding some special account of the disease in America, with regard to its frequency, the modifications, if any, which it has undergone, and the prevalence in different classes of the community. Acute gout is certainly a rare disease here, and heredity plays a very minor part in its causation. Even in the older cities, among members of the Brahmin class, to use Holmès's term, who for many generations have lived in comfort, the dis-



case is not prevalent. We would attribute this fortunate immunity very largely to the habits of temperance in food and drink, but in part, also, it may be regarded as connected in some way with those ethnical changes which have converted the juicy and plethoric Briton into the dry and spare American. This seems borne out by a comparison of the records of admission for acute gout in the large hospitals in this country with those of the London institutions. To the latter the potmen of the public houses and the draymen of the breweries, who consume large quantities of malt liquors, are frequently admitted with the acute disease, which here is certainly very uncommon in persons of the same occupation. It is true that the consumption of spirits is greater here than in England, and the prevalence of gout in a country is closely related to the amount of fermented liquors consumed.

The chemical theory of gout has much to commend it; but, as Dr. Draper says: "It must be acknowledged that while a defective oxidation seems to be the essential factor in the production, it is impossible to reduce the process to the simplicity of a chemical equation." He puts the question clearly in affirming that heredity and the mysterious influence of the nervous system complicate the problem of the malnutrition which leads to gout in such a way, that while the general proposition may be maintained that gout is a disease in which suboxidation occurs, it is not possible to affirm whether suboxidation is the essence of the disease, or only one of its phenomena. The gouty dyscrasia with its cutaneous, bronchitic, digestive, and renal manifestations, is well considered under the term atonic gout. If we hold with Garrod that gout never exists without lithatic deposits, the irregular or anomalous forms are as rare here as the acute, but Dr. Draper takes safe ground in his treatment of this difficult subject, and holds that the constitutional vice may be responsible for many troubles without ever exciting specific gouty outbreaks. There is, perhaps, no disease so blinding to the judgment of practitioners as this same gout. There are men, eminent consultants, who see its manifestations in one form or another, in nine of every ten patients who enter their rooms. Particularly is this the case in London, where recently a work on the disease has been issued by one of these enthusiasts, who sees gout in an extensive range of affections, from the vulvitis of young girls to certain forms of meningitis!

The subject of "Rachitis" is dealt with by Dr. Jacobi, of New York, with whose views the profession is well acquainted. In many cases the original disposition to the disease is to be looked for in intrauterine life, as the existence of foetal and congenital rickets has been fully established. After birth the most frequent cause is found within the diet or digestion of the patient. What it is precisely which acts injuriously and prevents the normal ossification processes is not determined. After carefully discussing the various statements, Dr. Jacobi concludes that they are not convincing except in one way; viz., "that both withholding and introducing certain ingredients, mainly lime, influence the growth of bone considerably." The clinical features, anatomical conditions, and the treatment are very fully considered.

For few diseases does the practitioner consult his library so seldom as for "Scurvy." Its almost total abolition from the category of maladies in civilized countries is one of the greatest triumphs of medicine in this century, and the name of Dr. James Lind, through whose exertions in the British Navy the world learned the practical lessons of prevention, should

ever be held in esteem. Dr. Philip S. Wales, of Washington, contributes a good practical article on this subject. From the U. S. Naval reports we gather that the disease is scarcely ever seen among the sailors, and on the U. S. Steamer "Jeannette," which spent two winters in the Arctic region, there was but one case of scurvy. Indeed there are now many more cases on land than at sea. Among the Italians who have recently come in such numbers to America and who are employed in railway construction, mines, and the coarser sorts of labor, scurvy is not uncommon. To economize, they live on very meagre fare and will not go to the expense of a varied diet. We hear also of cases among the Hungarians employed in the Pennsylvania coal mines.

In the article on "Purpura," Dr. I. E. Atkinson rightly doubts the existence of a distinct affection, and thinks that "it may eventually be proven that purpura, as we understand it, is merely a set of phenomena due to widely differing influences acting upon the blood and bloodvessels, and that the term will disappear from our nomenclature as indicating a disease, but will be preserved as denoting a symptom." Meanwhile, however, a consideration of the subject comes within the scope of a system of medicine. The affection is considered in its three important varieties: *purpura simplex*, *p. hemorrhagica*, and *p. rheumatica*. The etiology and pathology are carefully discussed, but we are still far from a satisfactory knowledge of the causes of the subtle changes in blood and vessels. Possibly the investigations of Petrone and Watson Cheyne on the occurrence of microbes in the bloodvessels may be in the right direction.

The subject of "Diabetes Mellitus" is ably considered by Dr. James Tyson, of Philadelphia, whose work on this disease is well known to the profession. The relations of glycosuria to irritative lesions of the medulla and the phenomena of the artificially induced condition serve as a basis for a very reasonable explanation of the disease, and not too much space is occupied by these problems. The author is inclined to attach more importance than he formerly did to pancreatic disease as a cause of diabetes. Certainly the number of cases in which this organ—usually so healthy—has been found affected is against the connection being accidental, and yet we do not remember any post-mortem record in which the solar plexus and ganglia have been found seriously involved. The sudden death in diabetes is usually with coma and is ascribed to acetonaemia, but it should be remembered that heart failure without any evidence of blood poisoning occurs in some cases. Upon what substances the diabetic intoxication depends has not been satisfactorily settled. It does not appear to be acetone, but is some, as yet unknown, product of the decomposition of sugar. The fat embolism theory has not been confirmed. A lipaemic state of the blood is more or less constant in diabetics, who are usually huge feeders, in whom the process of chylicification is much prolonged, and we should say that a lactescent condition of the blood serum is normal in them. The sections on urine analysis and treatment are very complete.

In the present state of our knowledge it is a task of great difficulty to write a satisfactory article on "Scrofula." Dr. John S. Lynch, of Baltimore, has given a full exposition of the current views, but, on the relation of tuberculosis to scrofula there is a turbidity peculiarly in keeping with this troubled subject. He holds, very correctly, that scrofula is not a disease *per se*, but merely a condition resulting from

malnutrition and faulty construction of the tissues, and no peculiar anatomical lesion can be ascribed to it, but "the scrofulous are more likely than others to have tuberculosis: 1st, because of their greater susceptibility to all morbid influences; 2d, because the scrofulous processes are apt to produce some cachectic condition which is always a condition precedent to tuberculosis; and, lastly, because the products of decay resulting from the scrofulous processes may enter the circulation and directly produce the tuberculous dyscrasia;" which is to say that the products of a process (scrofula) without any distinctive anatomical lesion can excite a specific affection such as tuberculosis; and yet in a previous paragraph is the statement "that a belief in the identity of the two diseases seems to be no longer tenable." There seems to be little doubt that many of the conditions which we speak of as scrofulous are in reality tuberculous, as shown by that most characteristic of tests, inoculation, and so far the processes are identical, but there are other conditions often spoken of as scrofulous, catarrhs, eczemas, ophthalmias, and the like, which are not necessarily tuberculous. We should understand by the word, not a disease, but, as Dr. Lynch says, "a condition resulting from malnutrition and consequent faulty construction of the tissues" in which all lesions are characterized by chronicity and intractableness. Of the lesions to which individuals of this constitutional disposition are prone, tuberculous are among the most common. Professor Fitz puts it very tersely when in his article in Vol I. of this System he says, "The scrofulous person is frequently tuberculous; the tuberculous person is usually scrofulous; the non-scrofulous person, however, may die of tuberculosis, while the individual may be scrofulous without containing tubercle."

"Hereditary Syphilis," which is considered by Dr. J. William White, of Philadelphia, is certainly a disease which concerns the general practitioner more than the special surgeon; and, as Dr. White says, it is in every way proper that the condition should receive *some notice* in a system of general medicine. If an exhaustive article, extending to between sixty and seventy pages, is what the author would designate by that term, we should like to know his ideas of a *monograph*; but we must hasten to say that there is not a page too much, and the article stands as perhaps the most exhaustive, as it certainly is one of the best, contributions to the subject in the English, or, indeed, in any, language. We have not space for the discussion of any of the interesting problems connected with this disease, and can only refer to one or two of Dr. White's conclusions. On the important question of the marriage of a syphilitic, he holds with Hutchinson, Fournier, and others, that after an interval of not less than four years, and after thorough specific treatment, a person may be permitted to marry, and in the majority of cases the danger of transmission is then quite trifling. The disease may be inherited from either parent, or from both, and the nearer the time of conception to the date of their infection the greater the probability that this will occur. It is very likely, though hardly proven, that when a child becomes syphilitic through paternal influence, the mother is also the subject of syphilis. The disease may be transmitted to the child from the mother even when it is acquired by the latter as late as the seventh month of utero-gestation. The pathology and symptoms of the various manifestations in the child are detailed at length, and the careful references and footnotes show a wide acquaintance with the labors of European and American syphilographers. In the section on syphilis of the teeth, the author states his



concurrence in the views of Mr. Hutchinson of the specific character of the changes in the upper (permanent) central incisors, and he rightly emphasizes the special points as originally laid down by the distinguished London surgeon, which many writers appear to have overlooked.

In the treatment of the disease in infants, Dr. White advises the administration of mercury by inunction spread on the flannel roller, as recommended by Sir Benjamin Brodie.

The editor, in his preface, says that he has compelled the omission, among other things, of numerous references, and while we must allow that too numerous foot-notes disfigure and encumber the pages, we are glad that in Dr. White's paper the editorial rule was honored in the breach, for in the copious references the interested reader will find much which adds to the value of this most able article.

The greater part of the second volume is taken up with a consideration of Diseases of the Digestive System.

Dr. J. Solis-Cohen contributes the articles on "Affections of the Mouth and Tongue, of the Tonsils, of the Pharynx, and Œsophagus." The sections on the mouth and tongue are very exhaustive; that on morbid dentition will be read with profit by many practitioners. In discussing the diseases of the tonsils, a more extended notice of follicular or lacunar tonsillitis would have been appropriate, considering its great frequency, and the mistakes in diagnosis which are daily made. The affections of the œsophagus are treated of at length.

"The Functional and Inflammatory Diseases of the Stomach," by Dr. Samuel G. Armour, of Brooklyn, are considered under the sections Functional Dyspepsia, Cardialgia, Acute Gastritis, and Chronic Gastritis. We miss a consideration of nervous dyspepsia, so called, which has been so much discussed of late; but the articles form valuable and practical contributions to some of the commonest diseases which the practitioner is called upon to treat.

The remaining affections of the stomach are dealt with by Professor Welch, of Johns Hopkins University, Baltimore. The articles on "Ulcer of the Stomach" and on "Cancer of the Stomach," are in many respects the most complete which have been written on these subjects, forming exhaustive monographs in which every detail has been carefully considered. The entire range of medical literature has been ransacked, and new statistics have been prepared from a very large series of collected cases. The sections on symptomatology, diagnosis, and treatment, leave nothing to be desired. It is not too much to say that these articles of Professor Welch are the most striking in the volume; in fulness of detail, in order and arrangement, in careful and judicious criticism they are models, and for reference in so many of the obscure problems which arise in these cases they will be storehouses of information for the perplexed physician. Other articles by the same author are upon "Hemorrhage from the Stomach, Dilatation of the Stomach, and certain Minor Organic Affections of the Stomach."

Dr. W. W. Johnston, of Washington, writes the papers on "Intestinal Indigestion, Constipation, Enteralgia, Acute Intestinal Catarrh, Chronic Intestinal Catarrh, and Cholera Morbus." Of these, the articles on intestinal indigestion and chronic intestinal catarrh deal very fully with subjects which have not received from systematic writers the attention they deserve; all are carefully prepared and valuable contributions to a common and important group of affections.



An extended article, by Dr. J. Lewis Smith, of New York, on "Intestinal Affections of Children in Hot Weather," is a valuable addition to the volume. The terrible mortality among young children from diarrhoea during the summer months, is one of the most remarkable features of the death returns in all our large cities. The entero-colitis which is responsible for a majority of the deaths, does not seem to be directly due to great heat, but the cause must be looked for in that state of the atmosphere engendered by heat where unsanitary conditions prevail. What the nature of the agent is has not yet been determined; the mycotic theory has not been proved. That diet is an important factor in the disease, every physician is aware. Cholera infantum, the most severe and acute form of the summer complaint, still awaits, like the cholera morbus of adults, a suitable explanation of its phenomena. Dr. Smith combats the view that it is identical with thermic fever, and believes it to be of an inflammatory nature. The treatment of these affections is considered very fully, and the reader will find an interesting discussion of the question of infant feeding, which has so important a bearing on the prevention of these complaints.

Dr. Wales, of Washington, has contributed an article on that curious affection which is more common than the text-books state, viz., "Pseudomembranous Enteritis." The view taken of the origin of these membranous exudates from the muciparous glands (Lieberkühn's) of the large bowel, is undoubtedly the correct one. We have seen the greater portion of the colon covered with just such a tenacious coherent membrane. Woodward's account of the disease in the *Medical and Surgical History of the Rebellion* is most excellent, particularly in the historical and anatomical details. Oddly enough, it is not referred to in this article. The connection of the affection with hysterical and nervous trouble remains inexplicable.

Dr. James T. Whittaker, of Cincinnati, contributes an important series of articles on "Dysentery, Typhlitis and Perityphlitis, Intestinal Ulcer, and Hemorrhage from the Bowels."

The admirable historical sketch which prefaces the account of dysentery reminds us what an important part this disease has played in all ages, and in the great wars of the world its victims have numbered more than those slain in battle. The Civil War furnished American physicians with unexampled opportunities for the study of the disease, and resulted in the publication of the most extensive work on the subject ever published (second volume of *Medical and Surgical History of the War of the Rebellion*), which, as Dr. Whittaker justly remarks, is a lasting monument to the labor and learning of its author, Joseph J. Woodward. Our knowledge of the etiology of the disease is in a most unsatisfactory state, and "the prospect of reconciling the accumulated discordant facts is very discouraging." The evidence in favor of contagion is, in some cases, too strong to be ignored, but the existence of a specific germ has not yet been determined, and it is held that at the present time dysentery must be regarded as a malady which stands in closer relation to, or finds a better analogue in, cholera than typhoid fever." In the treatment of this most painful disease irrigation of the large intestine and the thorough flushing out of its contents seem the most natural plan. The author strongly recommends the large nitrate of silver (3j-Oj) injections as used by H. C. Wood and Stephen Mackenzie. The chapter on the affections of the cæcum and appendix—typhlitis,

perityphlitis, and paratyphlitis—is a practical contribution to diseases too often overlooked or mistaken by the practitioner. We object to the term paratyphlitis as a very unnecessary refinement. It is sufficient to use the term perityphlitis to embrace all the cases in which the inflammation extends beyond the coats of the bowel, and in many instances this is at a point where they are not covered with peritoneum.

The subject of “Intestinal Obstruction” is considered by Dr. Hunter McGuire, of Richmond. After a tolerably full description of the various conditions which induce acute and chronic obstructions, the important question of differential diagnosis is discussed, and the general principles laid down for guidance in distinguishing the important varieties. The necessity for prompt surgical interference is insisted upon as soon as it is recognized that the acute obstruction is not due to enteritis or peritonitis, but to some mechanical cause. This article has suffered, probably, as have some others, from a prolonged stay in the hands of the editor, and a reference to the numerous recent contributions to the surgery of the intestinal obstructions would have added to the value of the article.

Dr. I. E. Atkinson, of Baltimore, in a brief chapter, deals with “Cancer and Lardaceous Degeneration of the Intestine.”

The section on “Diseases of the Rectum and Anus,” by Dr. T. G. Morton and Dr. Henry M. Wetherill, of Philadelphia, comprises a miscellaneous assortment of affections, most of them surgical, and quite out of place in a system of medicine. The editor would have done well to remember that a practitioner who would adorn his library with these volumes would certainly have a text-book of surgery. The more strictly medical conditions of the anus and rectum are far too briefly considered, particularly their relation to spinal disease.

Dr. Leidy contributes the article on “Intestinal Worms.” He agrees with other authorities that the *tænia saginata*, or beef tapeworm, is the most common, and states that of about fifty specimens sent to him during the past twenty years all have appeared to belong to this species. He has recently put on record another case of the *tænia flavo-punctata*.

An excellent account of “Trichinosis” comes very appropriately from the discoverer of this formidable parasite in the hog. A brief description of human parasites other than intestinal, is also given under their classified orders.

The extensive division upon “Diseases of Liver” is contributed by Dr. Roberts Bartholow, of Philadelphia. Under functional disorders there are short practical chapters on “Biliousness,” “Lithæmia,” “Hepatic Glycosuria,” and “Jaundice.” In the article on “Interstitial Hepatitis,” or “Sclerosis,” as Dr. Bartholow would rightly call it, instead of cirrhosis, we have simply a reference to the fact that several forms of the disease are recognized by French writers, but there is no special description of the hypertrophic form, which seems to be a well-established variety, nor of the fatty cirrhotic liver, upon which there have been several recent French memoirs and which is a very common condition. The section on “Biliary Concretions” is very complete, but upon treatment we miss a statement or summary of the results of cholecystotomy. The writer is sanguine on the subject of the solution of calculi in the gall-bladder, and thinks that facts are known which justify the belief that an impression may be made upon them. The use of the phosphate of soda in drachm doses three times a day has proved effective in his

hands. The plan of injecting the gall-bladder with solvents, Durandé's remedy or chloroform, is suggested.

The assistant editor, Dr. Louis Starr, gives a full account of the "Diseases of the Pancreas," the various affections being considered at greater length and in more detail than is usual; not more, however, than they deserve, for, in reality, the acute and chronic processes in this gland play an important part in abdominal disease, and these carefully prepared papers will, we hope, do something toward directing the attention of physicians to a more earnest study of the diseases of this organ.

The article on "Peritonitis," by Dr. Alonzo Clark, of New York, is an interesting one in many respects, particularly in regard to the opium treatment of the disease, for the introduction of which the profession is indebted to the veteran writer of the paper. He shows very clearly that although Graves and Stokes had both written upon the use of this drug in peritonitis, it had not been generally adopted, and it was not until after 1840 that its great value was recognized. The account which Dr. Clark gives of his early experience forms a very instructive chapter in the history of therapeutics.

An able essay on "Diseases of the Abdominal Glands" (tabes mesenterica), by Dr. Samuel C. Busey, of Washington, concludes the volume.

The index of 118 pages is bewildering in its fulness. On certain of the pages, by adding about half as many words a very readable summary or abstract can be obtained. There are a good many typographical errors, particularly in the footnotes and references.

The third volume is devoted to "Diseases of the Respiratory, Circulatory, and Hæmatopoietic Systems."

The articles on the affections of the upper air-passages are contributed by well-known specialists. Dr. Seiler, of Philadelphia, writes on "Laryngoscopy and Rhinoscopy;" Dr. Harrison Allen, of Philadelphia, on "Diseases of the Nasal Passages;" the late Dr. Elsberg, of New York, on "Diseases of the Larynx and Diseases of the Trachea;" Dr. Lefferts, of New York, on "Tracheotomy." Dr. Hosmer A. Johnson, of Chicago, writes on the "Neuroses of the Larynx," and Dr. Jacobi, of New York, on "Acute Catarrhal Laryngitis and Pseudo-membranous Laryngitis."

The "Diseases of the Bronchi" are considered by Dr. N. S. Davis, of Chicago. Contrary to the accepted opinion, he holds that the largest number of cases of bronchitis occur between the ages of ten and thirty years. The statistics of mortality are deceptive, as in more than half the cases reported under the head of bronchitis the fatal result is due to extension of the disease to the lungs. The different forms of the affection are considered under the divisions of acute, mechanical, capillary, rheumatic, pseudo-membranous, and chronic bronchitis. The etiology and symptoms of these varieties are considered separately, and the morbid anatomy and treatment considered together, which is not a very satisfactory plan. Scarcely space enough is devoted to such an important disease as capillary bronchitis. The writer appears to lay great stress on the rheumatic variety, but does not mention gout in connection with chronic bronchitis. Indeed, the consideration of this latter form is exceedingly meagre.

Dr. Geddings, of Aiken, South Carolina, writes the articles on "Bronchial Asthma" and "Hay Asthma." We naturally turned with interest to the latter paper to ascertain the author's views upon this much discussed



disease, but we were much disappointed not to find a fuller statement of the more recent and most important investigations of American physicians. The conclusion at which he arrives is expressed in the following paragraph :

"The experiments of Blakely justify the belief that the cause of the early form of hay fever which prevails in England is to be found in the pollen of a number of plants, particularly grasses and grains, which bloom in the late spring and early summer, while those of Marsh prove conclusively that the ambrosia *artemisifolia* or Roman wormwood, is certainly one, and probably the chief cause of the American or autumnal form of the disease."

Very scant justice is done to the labors of Daly, Roe, Allen, and J. N. Mackenzie, who have done so much to make clear the etiology of this troublesome affection. The pollen theory will doubtless continue to have its advocates, but it is daily losing ground, and the cure of the affection by local measures and by remedies which act on the nervous system is the most convincing proof of the correctness of the new views—*naturam morborum ostendunt curationes*.

Dr. Samuel C. Chew, of Washington, contributes four papers on "Dilatation of the Bronchial Tubes; Emphysema; Collapse of the Lung; and Congestion and Œdema of the Lungs," which are good practical expositions of our knowledge on these subjects.

Dr. William Carson, of Cincinnati, writes the articles on "Hæmoptysis," "Pulmonary Apoplexy," "Abscess of the Lung," and "Gangrene of the Lung." The first of these is a very valuable contribution, and presents a most careful and extensive analysis of all the facts relating to the subject. Among the statistical details we would have liked to see reference to the frequency with which hæmoptysis occurs in persons who do not become phthisical. Such figures are probably not available, but every practitioner can call to mind cases in which, after repeated hemorrhages no ill effects followed, and the patients have for years after remained free from pulmonary troubles.

The article on "Croupous Pneumonia" is from the pen of Dr. Alfred L. Loomis, of New York, and is an able clinical delineation of the disease. It is regarded as an acute, general disease, with a local manifestation. Some interesting facts are given to show that in New York the disease is on the increase. The infectious and epidemic characters are very briefly considered, and one looks in vain for some statement of the relations of microorganisms to the disease. The section on treatment contains much sound and judicious advice which we would earnestly commend to practitioners; there is still a great deal of meddlesome and unnecessary medication in pneumonia.

The editor, Dr. Pepper, contributes the article on "Catarrhal Pneumonia." The account of the morbid anatomy is very clearly drawn, but we gather that Dr. Pepper, the writer, still maintains the older views of the relation of this disease to phthisis, for he says "the presence of the degenerate cheesy foci, associated with alveolar and peribronchial thickening, may lead to catarrhal phthisis with or without true tuberculous formations." And elsewhere, in emphasizing the importance of the close and complicated connection between catarrhal pneumonia in its various types and subsequent organic diseases, he puts the relationship as follows :

"There may be a development of acute general miliary tuberculosis, owing to the depressing and irritating effects of the disease upon a constitution



strongly predisposed to tuberculosis, or tuberculous pulmonary phthisis may ensue, either directly as a complication or as a sequel to ulcerative changes of an inflammatory nature in the lungs. Finally, those who have passed through an attack of catarrhal pneumonia are usually left with such vulnerability of system that any predisposition to phthisis or tuberculosis is very apt to be readily called into activity."

Far too much space is occupied with the subject of "Pulmonary Embolism," by Dr. Beverly Robinson, of New York. It is a most exhaustive article upon a comparatively rare affection, but it scarcely accords with our sense of the proportion of things for the consideration of such a subject to occupy about the same number of pages as such an important disease as bronchitis.

What better guarantee for truth have we than the wisest men's acceptance of it? That the views of Koch upon phthisis should have so rapidly made headway against established doctrines, until now the adherents number the great majority of working pathologists and clinicians, is strong presumptive evidence in its favor.

In this country Dr. Austin Flint was one of the first to advocate the parasitic theory, and the weight of his authority and writings has done much to further it. His article upon "Phthisis," in this volume, is written from the standpoint of a unicist, and the morbid product which distinguishes pulmonary phthisis is regarded as tuberculous. The names denoting a non-tuberculous form, as catarrhal pneumonia, chronic broncho-pneumonia, etc., have shared the fate of the theory upon which they were based. The writer's views on this point, to which alone we can refer, are freely expressed in the following paragraphs:

"The name acute pulmonary tuberculosis denotes an affection which may be sharply separated from the chronic forms of pulmonary phthisis. The acute affection is characterized by the presence, exclusively or in great abundance, of miliary tubercles. It runs a rapid course, and the symptoms are those of an acute disease. The name phthisis implies a chronic affection. In a small proportion of the cases of pulmonary phthisis, miliary tubercles become developed in great abundance. In these cases acute pulmonary tuberculosis supervenes upon chronic phthisis. These cases, by those who regard phthisis in its ordinary form as a non-tuberculous affection, were designated cases of tuberculous phthisis. The fact that in cases of phthisis there is a liability to the supervention of miliary tubercles as abundantly as in cases of acute tuberculosis, is to be borne in mind, but it does not seem necessary to make a distinct variety of the disease on the basis of this fact. In some cases of pulmonary phthisis, the tuberculous product is notably large at the outset, and destructive changes in the lungs go on continuously with unusual rapidity. To these cases the name phthisis florida and galloping consumption have been applied."

It is accepted as established that the bacillus tuberculosis is always present in tuberculous products, and as uniformly absent in other morbid products, and

"that it is generally present in the sputa of phthisical patients and never present in the sputa of non-phthisical patients, and that the tuberculous disease in animals may be produced by inoculation with this organism after cultivation has been sufficiently continued to eliminate all else pertaining to the tuberculous product. On these data are based the conclusions that phthisis is an infectious disease—in other words, that it involves in its causation a specific agent capable of self-multiplication; that it is a communicable disease, and that the agent of the communication is the bacillus tuberculosis—that is, this agent is the contagium."

Dr. Edward T. Bruen, of Philadelphia, contributes the articles on "Syphilitic Affections of the Lungs," "Pneumonokoniosis," "Cancer of the Lungs," "Pulmonary Hydatids," and "Diseases of the Mediastinum."

"Syphilitic Phthisis" is a curious affection in its distribution. Subjects of it are quite numerous at the clinics and in the private practices of some observers, notably Pancritius, of Berlin, and Porter, of New York, while others seek for years, and often in vain, for a case, alive or dead, for demonstration and study. Dr. Bruen states that the question of the existence of a recognizable pulmonary syphilis "remains, even now, but partially removed from the field of debate and conjecture." In the diagnosis no mention is made of the importance of the presence or absence in the sputum of the bacillus tuberculosis.

In the article on "Pneumonokoniosis," speaking of miners' phthisis in England, Dr. Bruen has got his geographical and geological knowledge badly contorted. The sections on cancer of the lung and diseases of the mediastinum are carefully prepared articles. On the subject of "Pulmonary Hydatids" the writer has scarcely grasped the facts relating to the life history of the parasite, for he says, "like the latter (the cysticercus) *the larvæ infest the bowels of certain animals*;" and, again, he says that "pulmonary hydatids may occur as primary formations in the lungs, but may be *secondary to similar growths elsewhere, especially in the liver.*"

Dr. John S. Lynch, of Baltimore, writes the article on "Acute Miliary Tuberculosis," and his paper is a good practical exposition of our knowledge of this disease.

"The Diseases of the Pleura" are considered by Dr. Frank Donaldson, of Baltimore, in an extensive article of more than one hundred pages, replete with valuable pathological and clinical information. In discussing the subject of paracentesis, "liberal use has been made of a valuable communication specially prepared by Henry I. Bowditch for this purpose, and embodying the mature result of his study and experience." The writer affirms, and we fully agree with him, that to Bowditch, in conjunction with Wyman, is due the great credit of introducing the principle of aspiration, and also to a great extent it was through his persevering and skilful advocacy and performance of the operation that it became so firmly established in America upon a true, scientific basis. We regret that space does not permit us to refer to many interesting points in the section on purulent pleurisy.

"The Diseases of the Circulatory System" occupy only two hundred and fifty pages, and seem rather too briefly considered. Certainly, in comparison with the articles in Reynolds's *System of Medicine*, they are very short, not occupying much more than one-third the space. A closer comparison shows very clearly that it is not alone in length that the American articles are behind those of the English work. But this could have been predicted, for the section on the circulation in Reynolds's *System* is exceptionally strong, and the articles of Peacock, Sibson, Fagge, and Gowers, are perhaps the ablest contributed to that work.

The section on "Diseases of the Substance of the Heart" is written by Dr. William Osler, of Philadelphia, and contains a practical—but in places rather brief—exposition of the various conditions. We scarcely see why, except to follow customary usage, fibroid heart should be considered as a myocarditis. It is doubtful whether inflammation enters into

the process, and it is, strictly speaking, a degeneration. The interesting observations of Leyden, Martin, Welch, and others, have of late directed greater attention to the changes in the muscle substance, and the influence of arterial disease in inducing the degenerations. From these sources the writer seems to have obtained much valuable information.

Dr. Loomis, of New York, contributes the article on "Endocarditis and Cardiac Valvular Diseases." He prefers the terms exudative, ulcerative, and interstitial to designate the forms of endocarditis. The micrococci in the ulcerative condition are probably "developed by the septic ulcerative process rather than that they are the cause of such processes."

The affections of the various orifices are taken up *seriatim*, and the etiology, symptoms, and differential diagnosis considered.

In estimating the prognosis in valvular defects, the writer is of opinion that the loudness, harshness, and the area of diffusion of any cardiac murmur have very little to do with it. The murmurs rarely constitute a bad prognosis, unless hypertrophy and dilatation coexist. His experience seems to show that sudden death is almost as frequent in mitral stenosis as in aortic insufficiency, but the figures are small from which this conclusion is drawn. The advice upon treatment is brief but carefully prepared. No mention is made of the proposed substitutes for digitalis or of Oertel's plan of treatment by muscular exercise. The article, in fact, is a statement of Dr. Loomis's experience and views, and not an extensive monograph.

The papers on "Cyanosis and Congenital Anomalies of the Heart and Great Vessels," by Dr. Morris Longstreth, of Philadelphia, and "On Cardiac Thrombosis," by Dr. Beverly Robinson, of New York, are, proportionately to the importance of these subjects, the most extensive among the heart articles. Dr. Longstreth has entered at great length into the question of the anomalies, and his contribution will be of great value as a work of reference. We would have been better pleased had there been a few good illustrations, without them the description is apt to get monotonous.

Dr. Robinson's article is the most exhaustive on the subject in the English language. He divides the cardiac concretions into cadaveric, terminal, and ancient clots. It is curious, in such an elaborate review of the subject, not to find more extended notice of the free globular concretions (kugelthromben) which are usually single, and found in the dilated left auricle of mitral stenosis. The only mention is of a case of Pitres, in which the small globular concretions were found free in all the cavities of the heart.

Dr. Austin Flint writes the article on "Neuroses of the Heart," in which he considers first certain fundamental disorders and then angina pectoris and exophthalmic goitre. Angina is believed to depend upon ischæmia of the heart due to lesions of the coronary arteries. The sensory fibres of the cardiac branches of the pneumogastrics are believed to be the seat of the pain. Scarcely sufficient attention is given to the pseudo-anginal attacks and to the points of distinction between them and the true disease.

The "Diseases of the Pericardium" are treated of by Dr. J. M. Da Costa, of Philadelphia. The article on acute pericarditis is a valuable clinical contribution in which the general symptoms and diagnosis are sketched with great fulness. The rheumatic affection when unaccompanied with high fever usually runs, in the writer's experience, a favor-



able course, but where a complication of Bright's disease exists the prognosis is most unfavorable.

Dr. John B. Roberts writes a supplementary article on the "Operative Treatment of Pericardial Effusions," which will form a useful guide for practitioners, and will, we may hope, increase the frequency with which paracentesis is performed in cases of very copious effusions.

The "Diseases of the Aorta" are considered by Dr. G. M. Garland, of Boston. The symptoms of thoracic aneurism are fully given and the differential diagnosis clearly drawn. The section on treatment embraces a discussion of all the methods which have been advised.

The "Diseases of the Coronary, Pulmonary, Superior Mesenteric, Inferior Mesenteric, and Hepatic Arteries, and of the Coeliac Axis" are briefly described by Dr. E. G. Cutler, of Boston. The article on embolism of the superior mesenteric artery is very interesting, and this condition may be more frequent than the text-books lead us to suppose.

Dr. Andrew H. Smith writes the articles on "Diseases of the Veins" and on the "Caisson Disease." Our knowledge of this latter is largely due to the careful observations of Dr. Smith. He still adheres to the vascular and congestive theory in explanation of the phenomena of the disease and affirms that the beneficial effect of ergot in his hands is strong corroborative evidence of the truth of his views.

The section on "Diseases of the Blood and Blood Glandular System" is contributed by Dr. William Osler, of Philadelphia. The general pathology of Anæmia is discussed and there are brief articles on Plethora, Chlorosis, and Melanæmia. That on Chlorosis is too short when we consider its importance and the frequency with which cases occur. In the introductory section on the histological characters of the blood there is an extraordinary mistake in the number of white corpuscles per cubic millimetre, which is stated to be from "eight to fifteen millions!" The chapters on Leukæmia, Hodgkin's Disease, and Pernicious Anæmia present full statements of the recent views on these interesting affections. In the article on Hæmophilia full justice is done to the labors of American physicians who first described the disease. Gould's chart of the Yeaton family, which was published some years ago in the *Boston Med. and Surg. Journal*, is given, and it illustrates well the curious heredity in this most curious affection. Addison's disease and the various affections of the suprarenal capsules are also considered by this writer.

Dr. I. E. Atkinson writes the article on "Diseases of the Spleen," and gives a detailed description of the numerous pathological conditions.

Dr. D. Hayes Agnew, of Philadelphia, contributes the article on "Diseases of the Thyroid Gland," and Dr. Samuel C. Busey, of Washington, the concluding article on "Simple Lymphangitis."

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INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. AUTHORS AND SUBJECTS. Vol. VI. HEASTIE-INSFELDT. 4to. pp. [11] 1051. Government Printing Office: Washington, 1885.

No better analysis of this volume can be laid before our readers than that furnished by Dr. Billings in his official preface addressed to Surgeon-



General Murray. By it we learn that the author-titles contained in the sixth volume amount to 7900, representing 2543 volumes and 7250 pamphlets. It also contains 14,590 subject-titles of individual books and pamphlets, and 32,290 titles of articles in various periodicals.

The value of this catalogue has been again and again dwelt upon in these pages, so that, beyond reiterating former statements, there is little more that we can say. But, while glancing over the pages of vol. vi., we have been struck with one use that it can be put to different from that which belongs to most books, namely, to show men the very limited range of their knowledge. We have been humbled to find how little we know of purely professional literature, and this fact has been brought home to us by finding the name of Joannes Ernestus Hebenstreit displayed upon nearly two pages of the catalogue, by the titles of the works he wrote. It may be a sad confession to make, but we are compelled to admit that we had never heard of John E. Hebenstreit; and, had it not been for the labors of Dr. Billings and his coadjutors, both the author and his works would have remained buried in oblivion, so far as we are concerned. But now both we and our readers will be enabled to prate wisely of one who wrote so largely during the middle of the last century, and who gave his writings to the world through the famous press of Leipsic. Did our name appear even in one small corner of this great book, we should be proud; but how slight would be our claim to immortality alongside of John Hebenstreit! Indeed, we are inclined to envy Alexander Heastie, who wrote of yellow fever in 1830, and Joannes Carolus Insfeldt, who discoursed *De lusibus naturæ* in 1772, for the one begins this volume, while the other terminates it, so that no one will glance at the title-page and fail to know that such men lived.

The same plan upon which the other volumes of the Index-Catalogue were constructed has been pursued in this one, and, as the work progresses, its magnitude and importance must impress every observer. Again, we would congratulate Dr. Billings on the successful progress of the work; again would we utter the hope that Congress will make such suitable appropriations as will permit of a more speedy issue of the remaining volumes.

S. A.

#### RECENT EDITIONS OF WORKS ON DISEASES OF THE EAR.

THE EAR; ITS ANATOMY, PHYSIOLOGY, AND DISEASES. By CHARLES H. BURNETT, A.M., M.D. Second edition, revised and rewritten. 8vo. pp. 585. Philadelphia: Henry C. Lea's Son and Co., 1884.

A PRACTICAL TREATISE ON THE DISEASES OF THE EAR. By D. B. ST. JOHN ROOSA, M.D., LL.D. Sixth edition, revised and enlarged. 8vo. pp. xxii. 718. New York: Wm. Wood & Co., 1885.

THE increase in the knowledge of the etiology and treatment of diseases of the ear has been steadily augmenting during the past fifteen years, and that the literature of the subject is becoming correspondingly voluminous is attested by the bibliographical appendix to the last volume of *Transactions of the American Otological Society*, which gives

more than six hundred titles of books and papers as the sum of contributions during the year ending July 1, 1885. The revision of such a mass of material, its condensation, and the selection of the more important parts, render the compilation of a text-book no light task, and of such work, requiring intimate knowledge of the subject and its literature, as well as considerable powers both of discrimination and generalization, the books here briefly reviewed are excellent examples.

In the seven years which have elapsed since the publication of the first edition of DR. BURNETT'S *Treatise on the Ear*, there have been sufficient advances in the science of otology to demand considerable alterations in the original text, and indeed an entire revision of certain portions of the work, among which may be enumerated the chapters on Abnormalities of the Auricle, Otomycosis, Treatment of Chronic Otorrhœa, Classification and Treatment of Aural Polypi, and Diagnosis, Etiology, and Treatment of Aural Vertigo. The bulk of the volume in this second edition is not apparently increased, and Dr. Johnson's aphorism, that "books you may hold readily in your hand are the most useful after all," remains good; but in point of fact, by change in type and in leading each page, shows an increase of from fifteen to twenty per cent. of material, and by the entire omission of parts of the first edition which had become obsolete, space has been afforded for new and original matter.

In view of the general acceptance of the work of Dr. Burnett as a text-book, a review, such as might have been appropriate to the first edition, would be superfluous, and in justice to the reader all that is required is a notice of such changes as have made the newer edition necessary.

In the chapters on Anatomy and Physiology, Dr. Burnett has made no material changes, except in the addition of the investigations of Bigelow and Sapolini upon the chorda tympani as a distinct nerve, and in the substitution of some new and better illustrations, as, for example, figures 7 and 8, the outer and inner surfaces of the left temporal bone, and figure 26, the diagrammatic representation of the formation of the so-called pouches of the membrana tympani; these are original and published for the first time, as is also figure 48, drawn from a preparation by the author, and exhibiting a section of the complete auditory apparatus. In the chapter on Malformations and Diseases of the Auricle, figures 73, 74, 75, and 76, and the accompanying text, are also new. In the treatment of circumscribed and diffuse inflammation of the external auditory canal, especial mention is made of the administration of the sulphide of calcium, which the author has found of decided benefit in one-tenth grain doses, three or four times daily, in furunculosis, and of aspiration by means of Siegle's pneumatic speculum, and the insufflation of drying powders in diffuse inflammation; the principle of aspiration, applied to the humid and sluggish parts, being found not only to cleanse them, but also to stimulate them to healthy activity; the form of powder blower used is an ordinary quill cylinder with flexible rubber-tubing.

Dr. Burnett's previous observations on the subject of otomycosis give an especial value to anything that he may have to say in regard to parasitic growths in the ear, and comparison of the pages thereto relating in the first and second editions shows that in addition to the substitution of original drawings in illustration, the text has been largely rewritten; in regard to treatment the author says, "Until within a year or two, I had

always employed, as a germicide in these cases, alcohol, either pure or diluted with water. The destruction of the parasite is most easily and efficiently accomplished by thoroughly filling the fundus of the canal, and all other parts of the external ear affected by the growth of the fungus, with powdered boric acid, borax, or boric acid in combination with chinoline salicylate (one of the latter to sixteen of the former). An ear affected with *aspergillus* should be seen every day by the surgeon, who alone should syringe it, and thus remove the loosened portions of the membrane; after the ear is thus cleansed a fresh insufflation should be made. Alcohol is undoubtedly an efficient parasiticide, but it does not act as rapidly as the powders named, it is not as easily applied, nor is its use in the ear free from discomfort to the patient; the less dependence placed upon fluid applications in these cases the better."

The articles on *seborrhœa* and *pruritus auris*, on displacement of the auricle for removal of foreign bodies and on reflex ulceration in the auditory canal, are new in this edition, and the observations on the latter subject are, we believe, original with the author; other new material, to which attention may with advantage be directed, is given as follows: p. 302, sebaceous tumors of the canal; p. 312, fracture of tympanic bone; p. 313, vicarious menstruation and abscess of the *membrana tympani*; pp. 321 to 339, comprise a previous paper on perforations of the membrane of Shrapnell, revised and extended; p. 345, vascular tumor, moles, and hæmatoma of the *membrana tympani*; p. 389, syphilitic disease of the middle ear; p. 409, accumulation of sero-mucus in the tympanic cavity; p. 421, objective snapping noises in the ear, with account of a peculiar case of "clicking sounds" in the ears traced to muscular spasm in the upper fibres of the superior constrictor of the pharynx; p. 437, malignant growth (small-celled sarcoma) in the naso-pharynx involving the ear; p. 443, traumatism of the mastoid; p. 455, aural symptoms resulting from affections of the teeth; p. 468, exposition of the advantages of the dry treatment of *otorrhœa*; p. 496, aural polypi, with the following new classification: 1. Granulation tumors, usually of small size, dark color, soft consistence, bleeding freely, occurring where the suppurative process has been rapid and intense, and comprising about one-half the entire number of aural polypi; 2. Soft, or mucous papillomata, large, club-shaped, light color, elastic, do not bleed freely, surface generally lobulated, occurring where the irritation has been prolonged and not intense, and comprising about ninety per cent. of all aural polypi other than granulation tumors; 3. Fibromata, large, dense, pale colored, usually covered by a multiple layer of pavement epithelium, developed from the periosteal lining of the tympanic cavity (Schwartz), very rare; 4. Myxomata more rare than polypoid fibromata, not half a dozen instances having been satisfactorily described; pp. 544 to 555, on aural vertigo, are entirely new in this edition, and will repay careful reading.

In addition, it may be said that the author has entirely rejected the operation of tenotomy of the tensor tympani, that more stress is laid upon the treatment of the nares in chronic aural catarrh, and that in the treatment of *otorrhœa* he has abandoned the giving the syringe into the patient's hands, and much less frequently advises medicated instillations.

The second edition, as a whole, not only fully bears out the reputation achieved by the first edition, but adds to it, inasmuch as it gives



the more recent investigations in the field of otology enriched by the observations of so good an authority as the author.

That a text-book on a special subject in medicine should have reached its sixth edition in the space of eleven years is a gratifying illustration both of the value of the work as a means of instruction and of the advance of the specialty to which it is devoted. The sixth edition of DR. ROOSA'S *Treatise on Diseases of the Ear* contains more than one hundred and fifty additional pages, and more than thirty new illustrations. The general arrangement of the work is the same as that in the earlier editions, and is an admirable one both for the sequence of the various subjects and for ease in ready reference.

The sketch of the progress of otology, which forms the first chapter, has, of course, been extended to date; and the chapter on the methods of testing the hearing and on examination of the ear and throat is appropriately made to precede the chapter on anatomy of the external ear, as was not the case in previous editions. The woodcuts illustrating the manner of holding the aural speculum and mirror, and of introducing the Eustachian catheter, are new and a decided improvement on those which they have replaced, though it is a question whether anything less than a demonstration of these two performances can be of much instruction to the general practitioner; the text describing the manipulation of the catheter, however, is very clear, and affords the next best instruction to the demonstration mentioned.

The chapters on diseases of the external ear have been considerably extended by the addition of new material with eleven new illustrations. In speaking of furunculosis, the author quotes the communications of Löwenburg, but does not agree with that writer in regard to the ready communicability of furuncles. The article on foreign bodies in the ear has been enlarged, Green's and Buck's cases of detachment of the auricle for the removal of foreign bodies are quoted at length, and there is, in addition, a *résumé* of the observations of Noakes on ear cough. Both the chapters on anatomy of the middle ear and on injuries have been enlarged by the addition of much new and valuable material, as we should have a right to expect, since diseases of this portion of the auditory apparatus furnish by far the largest number of cases for observation.

To the chapter on acute aural catarrh, which contains, by the way, some excellent advice in regard to sea-bathing and on the treatment of the sometimes resultant condition, is added the subject of vascular tumors of the membrana tympani, and of diphtheritic inflammation of the middle ear.

In the chapter on chronic non-suppurative inflammation of the middle ear, more attention has been given advisedly to the differential diagnosis and to the peculiar symptom of hearing better in a noise; in regard to this latter, the author states that the opinion given in previous editions that boilermakers, for instance, hear better in a noise is strikingly incorrect, and from his more recent observations he draws the following conclusions:

1. There is a large class of people suffering from impairment of hearing in quiet places, who hear very acutely and with comfort in a great din or noise.
2. The disease causing the impairment of hearing thus relieved is situated in the middle ear. It is usually observed in the chronic non-suppurative form of disease of the middle ear, but it may also be found



in acute or subacute catarrh of this part as well as in chronic suppurative process with loss of the whole or a part of the membrana tympani. 3. The proximate cause of this phenomenon is not as yet positively known. It is probably to be found in some change in the action of the articulations of the ossicula auditus.

In regard to the results of treatment of chronic non-suppurative inflammation of the middle ear, the author's conclusions, based upon twenty years of observation, are worth quoting: 1. Chronic catarrhal inflammation in young subjects is susceptible of relief and cure in a large proportion of cases. 2. In adults it is susceptible of relief and alleviation in about twenty per cent. of the cases; of cure, in none. 3. Chronic proliferous inflammation remains as yet incurable, and is not susceptible of alleviation or relief, either in the young or old subject, in more than five per cent. of the cases.

The chapter on chronic suppurative inflammation of the middle ear, its complications and consequences, have been extended from ninety-eight pages to one hundred and twenty-eight pages, the increase being devoted principally to the questions of treatment, and to mastoid disease and its operative relief.

To the chapter on anatomy of the internal ear has been added an article on its physiology, and the subject of diseases of the internal ear, which occupied but twenty-nine pages in the third edition, has devoted to it seventy pages in the present volume. It is needless to say that it is very much more understandingly treated than in the edition of ten years ago, because it is in a better understanding of the internal ear and of its relations to the general economy that a large part of the advance of the last decade has been made. The various tests with the tuning-fork are very thoroughly given, but the author does not, in the opinion of the reviewer, attach sufficient value to the test with high musical tones. The articles on syphilis of the labyrinth, on cerebro-spinal meningitis, parotitis, and boilermakers' deafness, with their appended reports of cases, and the observations on the effects of quinine, are particularly interesting, and in regard to the use of electricity in the treatment of diseases of the internal ear and in diagnosis, to which space had been accorded in earlier editions, the author concludes that the value of this remedy has been greatly overestimated.

In conclusion, this book, with its seven hundred pages of clear type, embodying the results of long and acute observation and careful thought, can be most confidently recommended to the student and to the practitioner.

C. J. B.

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LES TRAVAUX DU LABORATOIRE DE PHYSIOLOGIE DE LA FACULTE DE  
MÉDECINE DE PARIS. Pub. par le docteur J. V. LABORDE. 8vo. pp. 223.  
Paris: Asselin et Houzeau, 1885.

MEMOIRS FROM THE PHYSIOLOGICAL LABORATORY OF THE PARIS FACULTY  
OF MEDICINE. Edited by Dr. J. V. LABORDE.

THE memoirs of this volume are grouped under the title of physiology as that science was interpreted by writers of the schools of Haller and of John Hunter. The later writers would assign many of these essays

to the sciences of toxicology, pathology, and morphology. Dr. Laborde and his associates have embraced, under the head of physiology, subjects so remote one from the other as the functions of the gastric glands, the development of the heart, the action of alkaloids and of cinchona bark, and the anatomy and pathology of the human ear.

As is commonly the case in volumes of the kind, the themes are unequal in interest. Laborde, in operating on the semicircular canals, proposes dividing the operation of inducing artificial lesion into two stages; the first stage is devoted to the exposure of the canals, and the second (after an interval of twenty-four to forty-eight hours) to their division. The unilateral curvature of the head, which follows some of the sections, is attributed to the persistent contraction of muscles on the corresponding side of the neck.

Duval and Laborde, in experimenting on the sensory root of the fifth nerve as it lies in the medulla oblongata, conclude that the same lesions ensue as when the trunk of the nerve is divided. The bulbar sensory root is assumed to arise from the tubercle of Rolando, and the region itself to lie at the median side of the restiform body.

Gellé contributes three papers on the ear—namely, one on the anatomy of the tympanic membrane, one on the formation of bands of pathological character in the middle ear, and on the characters presented in an autopsy of the ears of an executed criminal. A. Lemoine narrates the results of recent studies on the localization of the brain. Accompanying his essay is a copious bibliography.

In the character of its illustrations, and in mechanical details, the volume is not equal to other contributions to literature of its class. The plates, while showy, are badly arranged and will not stand close scrutiny. Two entire forms are omitted from the table of contents,

Apart from the value of many of its essays, the book is interesting as an evidence of the drift of physiological work in France. This work is found to ally itself with the Italian methods rather than with the German or the English, and to be in close harmony with the thought of the earlier eras of physiology.

H. A.

THE ESSENTIALS OF HISTOLOGY, DESCRIPTIVE AND PRACTICAL. FOR THE USE OF STUDENTS. By E. A. SCHÄFER, F.R.S., Jodrell Professor of Physiology in University College, London; Editor of the Histological Portion of Quain's Anatomy. 8vo. pp. 245. Philadelphia: Lea Brothers & Co., 1885.

THIS admirable work, the healthy outgrowth from the small duodecimo published by its author eight years ago, is a cheering example of well-won success, earned by the faithful and diligent pursuit of excellence in presentation of this essential foundation of all true medical science. Even a cursory examination of the author's former *Course of Practical Histology*, was sufficient to impress any medical man with a sense of its superiority as a text-book, and its constant employment for years as a guide to students engaged in the practical study of histology, has only served to strengthen our original conviction of its high intrinsic value as an aid to teachers of this important subject.

Prof. Schäfer informs us, in his preface, that the book was written with the object of supplying the student with directions for microscopical examination of the tissues, and the instructions he gives in their present improved form are so clear, precise, and practical, that little room for further improvement in these respects seems now to exist. At the same time that it is especially adapted for laboratory work, care has been taken to render it useful as an elementary text-book of histology, comprising all the essential facts of the science, but omitting unimportant details the discussion of which is only calculated to confuse the learner. For conveniently accompanying the work of a class of medical students, the volume is divided into forty-two lessons. Each of these will occupy a class from one to three hours, according to the extent of preparation expended beforehand upon the various tissues and organs by the teacher. A rule adopted by our author, to recommend only those methods upon which long experience has proved that full dependence can be placed, is faithfully carried out, and largely contributes to the satisfaction with which the work, in its former less developed form, has been used as a text-book, both in England and America.

Among the improvements which Prof. Schäfer has fortunately been able to effect, one of the most noticeable is the large number of additional figures which are inserted. One of the few faults that could justly be found with the *Course on Histology*, was the paucity of its illustrations, since it only contained at first about forty woodcuts; but this deficiency has been so fully remedied in the volume under consideration that two hundred and eighty-one, or more than seven times the original number, have been introduced. Nor are these, as is too often the case in works upon microscopy, mere diagrams or venerable figures duplicated and re-duplicated upon successive pages in delusive repetition. With a few rare exceptions, all are worthy of careful and attentive study; valuable not only to the active practitioner who wishes to refresh his memory in regard to the actual appearance of tissue elements under the microscope, but also, and especially, to the student of histology, for whom they indicate the exact morphological characteristics which it is his privilege to bring clearly into view, under his own objective, in his most successful preparations.

Since this new work of Prof. Schäfer's will doubtless be speedily placed upon the list of text-books required in every progressive medical college, we feel that it needs no further recommendation at our hands.

J. G. R.

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ANEURISMS OF THE AORTA, WITH ESPECIAL REFERENCE TO THEIR POSITION, DIRECTION, AND EFFECTS, BEING AN EXERCISE FOR AN ACT OF THE DEGREE OF M.B. IN THE UNIVERSITY OF CAMBRIDGE. By OSWALD BROWNE, M.A., M.B., of Trinity College, lately House Physician at St. Bartholomew's Hospital. Pp. 18, xv. London: H. K. Lewis, 1885.

WE have in this carefully prepared essay a study of 88 fatal cases of aneurism of the aorta occurring in St. Bartholomew's Hospital during seventeen years. Of these there occurred 31 aneurisms of the ascending



portion, 29 of the transverse, 10 of the third part, 8 of the thoracic aorta, and 9 of the abdominal aorta. 74 of the cases were in males.

Certain of the conclusions arrived at, though similar to those of other writers on the subject, are worth restating. Aneurisms of the first portion of the arch arise with great frequency immediately above the heart valves, from the right or dextro-anterior aspect of the artery, and take a direction to the right, presenting near the sternum in the third intercostal space. The pulmonary artery or superior cava are the structures most frequently compressed, and rupture, which occurs seldom, is into either pericardium or right pleura. Aneurisms of the second portion of the arch take either an upward direction and present beneath the first bone or the sternum, or in the first and second right intercostal spaces, or pass directly back, compressing the trachea. The left recurrent nerve it sometimes compressed, the vena innominata being seldom, the vena cava superior never, compressed; rupture occurs rarely, and is either into the left pleura, left bronchus, or the trachea.

Aneurisms of the third portion originate usually just below the orifice of the left subclavian and pass backward and to the left, lying to the left of the spinal column, commonly eroding more than one of the upper dorsal vertebræ; the œsophagus is more frequently subjected to pressure, and the termination is often by rupture into the left pleura or the œsophagus.

Sixty of the eighty-eight cases occurred in the ascending or transverse portions of the arch, and in only ten of these cases was there incompetence of the aortic valves. We would have been glad to see a statement concerning the size of the heart. Five tables give the details of the cases as affecting the various regions of the aorta. A short but interesting historical note precedes the substance of the paper. W. O.

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MILK ANALYSIS AND INFANT FEEDING. A Practical Treatise on the Examination of Human and Cow's Milk, Cream, Condensed Milk, etc., and Directions as to the Diet of Young Infants. By ARTHUR V. MEIGS, M.D., Physician to the Pennsylvania and to the Children's Hospital. 12mo. pp. 102. Philadelphia: P. Blakiston, Son & Co., 1885.

THE author of this work has made the laudable attempt to found his views on infant feeding on a strictly scientific basis; in other words, on an accurate analysis of human milk, being convinced that all artificial foods must approach the composition of the infant's natural food to have a physiological recommendation for their use.

The author finds that as a result of his analysis of human milk, there is "never more than one per cent. of caseine." This statement is entirely at variance with all previous conclusions; and as everything is made to rest on it, must be subjected to rigid scrutiny before it can be accepted.

It is impossible, in discussing the subject, to avoid comparison with the results and methods of Prof. Albert Leeds. The investigations of the latter writer are among the most numerous, searching, and complete ever published on this continent, if they do not actually occupy the



very first position. Leeds urges the following objections against Meigs's method:

(1) That evaporation of milk over a water-bath, in order to obtain the *total solids*, is slow, and not entirely accurate. We do not believe that perfect drying can be thus effected, and the method is certainly tedious.

(2) The quantity of *fat* is too large by Meigs's method, inasmuch as the milk is not treated with absolute ether, but usually by a mixture of ether and water, which takes up other matters than fats (milk-sugar). This Leeds proves to be the case, and was the conclusion we had arrived at ourselves before reading Leeds's papers at all.

(3) The treatment to get *caseine* separated from sugar does not admit of entire accuracy by reason of errors inherent in "decantation," and owing to the fact that caseine is not wholly insoluble in boiling water. We think this objection is also well taken.

As a result of analyses by Meigs's methods, the proportions of fat and milk-sugar would be too high and those of the albuminoids too low. We are surprised that Meigs seems to ignore entirely the presence of other albuminoids than caseine in human milk. But we are still more surprised that he makes the scantiest reference to the German literature of this subject. It is a well-known fact that for years, in Germany, much valuable work has been done at the agricultural stations on this very matter of milk analysis. Even Hoppe-Seyler's *Handb. der Physiolog. Chem. Anal.*, in which the subject is treated in that writer's usual able style, is not once referred to, we believe.

Such being the case, it is not to be wondered at that Meigs should take such narrow ground in regard to the *reaction* of cow's milk. We hold still, that the statement of standard works, that the reaction of cow's milk is variable, being sometimes faintly alkaline, sometimes neutral, and sometimes acid, expresses the truth in the main—*i. e.*, for milk, as it comes fresh to us for use, and that is the practical question. Meigs's tests, made at *one* dairy farm, of milk freshly drawn from the animals on *one* occasion, do not settle the question, even as to perfectly new milk; we must know whether a change in feeding, etc., will not change the reaction: in fact, we do know that such is the case. The reaction is said to change also on standing.

We notice a similar kind of oversight in the author's method of collecting his samples of human milk.

If we are to draw accurate conclusions as to the composition of milk, we must know details regarding the specimens collected, as given in Leeds's tables, or better still, perhaps, use only average milk (as we do average urine) by taking the total quantity secreted for twenty-four hours.

As to Leeds's own method, which is the Gerber-Ritthausen one, we may say, in general, that it seems to meet the case better than any yet proposed, though we do not regard the method of separation of albuminoids as wholly satisfactory. With Meigs, we fear filters where caseine is concerned. But the other methods in the process seem to answer well; and even if there be slight loss of albuminoids by the Gerber-Ritthausen method, it will still appear that Meigs's estimate of one per cent. is altogether too low for caseine, for the Gerber-Ritthausen method gives as an average about two per cent. Meigs argues that because a mixture, such as he proposes as an infant food, is, "in its appearance, taste, and

reaction strikingly like human milk," there is therein a corroboration of his views. But Meigs, as well as Leeds, has shown that reliance cannot be placed on the appearance, etc., of milk to indicate its composition.

We believe in the "milk of human kindness," and that there is more of it now than among the ancients, but we do not subscribe to the logic of Dr. Meigs in his introduction; and if this chapter, and certain passages in the last one, had been omitted, it would have been better for a work aiming to be scientific. What of a statement like that on page 90? "It is well to give young infants nothing but their regular food, and not to give pieces of cake, or candy, or anything else of the kind, for the pleasure of seeing them enjoy it." Now for whom is this written, for the medical reader or the general public? For the former it is worse than superfluous. If for the latter, then we must unhesitatingly condemn the introduction of any such methods of lowering our scientific literature. It simply degrades an admirable book like this beyond all limit, and is something the profession must avoid, if it will remain true to its higher instincts.

Though it seems to us the methods and results given in this work will not all bear the closest scientific examination, we are glad that Dr. Meigs has essayed so difficult a subject. He has set a worthy example, and there is one golden page (71) in this little book, showing a moderation in spirit, and a conception of the scientific attitude, we could wish widely read and pondered upon in the medical profession. Dr. Meigs's book shows the great need for just such investigation as he has done; and the general indifference to the value of the collateral sciences; the widespread ignorance of chemistry, and its applications or possible applications to medicine, must be deplored by those who aspire to place the healing art on a truly scientific foundation. This book is written in a most lucid and agreeable style, and if it serves the purpose of bringing some third worker into the field to improve on all previous methods, a great end will have been served, and one in which, judging by the spirit of the book, the author of "Milk Analysis and Infant Feeding" will rejoice."

T. W. M.

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THE INHALATION TREATMENT OF DISEASES OF THE ORGANS OF RESPIRATION, INCLUDING CONSUMPTION. By ARTHUR HILL HASSALL, M.D.  
 Lond. 8vo. pp. 367. London: Longmans, Green and Co., 1885.

If the author had accomplished nothing more than the positive demonstration by experiment of the fact that oral and oro-nasal inhalers, as hitherto constructed and used, almost wholly fail of their object, his book would be as welcome as the papers which he has from time to time contributed to the journals on this and similar subjects have been. But he has accomplished much more than this. He has given us in a convenient hand-book the results of much painstaking experimental research in the subject of medication by inhalation, including the chemistry and physics of the substances employed for this purpose, and the mechanism of the more practical of the apparatus used. In these respects his book is by far the most satisfactory of the few treating of the subject in the English language. It is also more comprehensive than the German

treatises, which, for the most part, as in the case of that of Waldenburg, are devoted to descriptions of the instruments and methods of the writer.

The results of carefully conducted experiments, the details of which are given with much exactness, show that four-fifths of the more important antiseptics, such as carbolic acid, creasote, and thymol, may be recovered, with the ordinary inhalers in use, from the sponge or receptacle after the inhalation is completed. The author's chamber inhaler, of which there are two forms, and a globe inhaler for the mouth and nose, and another for the mouth alone, are figured and described. These appliances are constructed with a view to obviating the defect of a too restricted surface of exposure for the medicament, shown to be present in all the instruments heretofore in use. The subject of inhalation chambers is discussed at much length, and one constructed by the author, at San Remo, is described in detail. Those portions of the volume devoted to the description of remedies of all kinds and of the whole range of disorders of the respiratory system, whether treated by the method of inhalation or not, are less satisfactory than those indicated by the title. Indeed, if we may be permitted to exercise the right of a critic, it will be to say that the fault of the book lies in its being too comprehensive.

The subject of the treatment of pulmonary disorders by inhalation is again attracting the scientific attention it deserves, but has not, of late years, received. Dr. Hassall's book is opportune, and will be read with gain and pleasure by all who are anxious to inform themselves as to the present state of knowledge in this field of practical medicine.

J. C. W.

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A TEXT-BOOK OF PHYSIOLOGY. By M. FOSTER, M.A., M.D., F.R.S., Prælector in Physiology, Cambridge. Third American from the Fourth and Revised English Edition. By EDWARD T. REICHERT, M.D., Demonstrator of Experimental Physiology in the University of Pennsylvania. Royal 12mo. pp. 911. Philadelphia: Lea Brothers & Co., 1885.

THE appearance of another edition of this useful work, is a substantial guarantee of its excellence and practical value, to which the changes which have been recently made largely contribute. The higher and more recondite portions of the science are lightly touched upon, or altogether omitted, because less adapted to the capacities of medical students, for whom the work is especially intended. In his selection of subjects for cursory consideration, the author has shown himself eminently judicious, with the one exception of the department of embryology, to which, on account of its intimate association with all three of the great practical branches of medical science, and especially its aid in tracing the pedigrees of diseases, much larger space should have been allotted.

The "additions, corrections, and alterations," for which we are indebted to the able and industrious editor, are not so specifically designated as is customary; but if the brackets enclosing many portions of the book indicate Dr. Reichert's share of the work, the adjective valuable might well be conjoined with that of numerous, employed in the American preface to characterize his contributions.

J. G. R.

# QUARTERLY SUMMARY

OF THE

## PROGRESS OF MEDICAL SCIENCE.

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### ANATOMY.

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UNDER THE CHARGE OF .

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#### THE ANATOMY AND MORPHOLOGY OF SOME OF THE CONSTITUENTS OF THE SKULL IN THE SPHENOIDAL AND PALATINE REGIONS.

MR. J. BLAND SUTTON (*Proceedings of the Zoölogical Society of London*, December 2, 1884, and June 2, 1885) raises weighty objections to the current views respecting the morphology of some of the constituents of the skull in the sphenoidal and palatine regions, and proposes important modifications based mainly upon the study of development. He regards the parasphenoid of osseous fishes and amphibia as corresponding to the vomer of mammals, the two agreeing in origin (ossification in membrane), position, form, and relations, while the bones, usually called vomer in fishes, are represented by portions, here termed *prepalatine*, of the superior maxillary bones of mammals.

In order to elucidate these homologies, the mode of ossification of the mammalian upper jaw has been specially investigated, and is described as proceeding from four centres, the extent of which is illustrated by figures of the bone in the human fœtus. The originally separate parts are:

(1) The *premaxilla*: the innermost part of this is of cartilaginous origin; being formed in the anterior extremity of the ethmo-vomerine plate. If anything interfere to prevent the premaxillary bone from meeting the ethmo-vomerine plate, the tip of this cartilage ossifies independently, and the double premaxillary bones described by Albrecht in cases of cleft palate and harelip are thus explained.

(2) The *prepalatine* portion, comprising the palate plate and a considerable portion of the inner wall of the antrum.

(3) The *maxillary* centre, including all the facial and orbital parts of the bone internal to the infraorbital canal.

(4) The *malar* piece, situated external to the infraorbital canal.

A new account is also given of the origin of the pterygoid element of the skull. In the human fœtus, at an early period, a cartilaginous bar is given



off from the upper end of Meckel's cartilage, subsequently the malleus, to near the extremity of the fronto-nasal cartilage. This represents the palato-quadrato arch of elasmobranchs, amphibians, etc., and undergoes metamorphosis as follows:

(a) The anterior portion ossifies as the pterygoid bone, the internal pterygoid plate of human anatomy.

(b) The middle part remains throughout life as the cartilaginous portion of the Eustachian tube.

(c) The posterior extremity degenerates into fibrous tissue and becomes the anterior ligament of the malleus.

In studying the ossification of the sphenoid bone, Mr. Sutton has discovered that not only the pterygoid, as above mentioned, but also the portions of the body bearing the lingulæ sphenoidales are developed in cartilage. The number of centres observed by him agrees with that of the generally received accounts, but there is some difference in the dates of their appearance and junction, as will be seen by the following summary:

In the eighth week of foetal life there appear in rapid succession centres for (1) the alisphenoids, (2) the basisphenoids, (3) the lingulæ, and (4) the pterygoids. At the beginning of the third month the nuclei of the orbitosphenoids appear, and later than these the presphenoidal centres, which, however, differ from all the foregoing in beginning on the surface of the cartilage beneath the perichondrium. In the course of the third month the basisphenoidal nuclei coalesce, and the lingulæ become united to the basisphenoid.

In the fourth month the orbitosphenoids join the presphenoids, and the pterygoids usually join the alisphenoids. In the seventh month the presphenoids and the postsphenoids coalesce, and in the eighth month the two presphenoidal centres fuse together.

During the first year after birth the alisphenoids with the pterygoids coalesce with the lingulæ around the Vidian canal, which is a passage left between these three elements, and the ossification of the sphenoidal turbinal commences.

From the fact that the lingulæ are developed in cartilage, the author concludes that they cannot, as supposed by Huxley and Parker, be the representatives of the basitemporals of birds, which are developed in membrane; and in support of this view he figures the base of the skull of a young ostrich in which a lingula sphenoidalis of cartilaginous origin is present on each side between the basisphenoid and alisphenoid, as well as the usual basitemporal bones. In the fowl, also, a separate centre is present for this portion of the body of the sphenoid. The lingulæ are the representatives of the sphenotic element of the fish's skull, and the basitemporals of the bird are identified with the bones usually termed pterygoids in the skull of the crocodile, for which the name *postpalatine* is proposed, while the so-called os transversum of the latter animal is the true pterygoid.

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#### THE INDEX OF THE PELVIC BRIM AS A BASIS OF CLASSIFICATION.

PROF. WILLIAM TURNER describes (*Journal of Anatomy and Physiology*, vol. xx., Part 1, October, 1885) the variations in the form of the pelvic brim in the different races of men, and proposes a classification similar to that in

use for the various forms of the cranium. The index is calculated in the usual manner, the transverse diameter being taken as the standard, and the proportion of the conjugate diameter to this giving the index according to the formula:

$$\frac{\text{Conjugate diameter of brim} \times 100}{\text{Transverse diameter of brim}} = \text{index of brim.}$$

According to the form of the brim, as expressed by the index, the author divides pelves into three groups, which are thus defined:

Those in which the index is above 95 are termed *dolichopelvic*, those with an index below 90 are *platypelvic*, while those in which the index ranges from 90 to 95, both inclusive, are *mesatipelvic*.

The results obtained by Professor Turner from his own measurements, and from the published observations of previous writers, are summarized by him in the following table showing the distribution of the three pelvic forms amongst a considerable number of people or races. In all cases male specimens only are used for comparison, since the racial characters are more pronounced in that sex; the female pelvis showing a greater similarity of form in different races. A query indicates that the number of observations available is not sufficient to settle definitely the group in which the people should be placed.

DOLICHOPELVIC.	MESATIPELVIC.	PLATYPELVIC.
Australians,	Negroes,	British,
Bushmen,	Tasmanians,	French,
Hottentots,	New Caledonians,	Germans,
Kaffirs,	Melanesians generally?	Europeans generally,
Andamanese,		Guanche?
New Zealanders?		Esquimaux?
Polynesians generally?		Laplanders?
Malays,		Chinese,
Ainos?		Mongolians generally,
		American Indians.

Some remarks are added on the form of the sacrum, and a sacral index is calculated by multiplying the breadth by 100 and dividing by the length. The examples given show that the proportions of the sacrum are related to the shape of the pelvic brim, and that both in the dolichopelvic character of the brim and in the relatively greater length of the sacrum, the Australians, Kaffirs, Bushmen, and Andamanese approach most closely of the races examined to the simian type, while the negroes occupy an intermediate position between these races and Europeans.

SACRAL INDEX.	
Kaffirs . . . . . 92.8	Australians . . . . . 98
Bushmen . . . . . 94	Negroes . . . . . 105.5
Adamanese . . . . . 94	Europeans . . . . . 112

This paper was communicated to the Anthropological Section of the British Association at the Aberdeen meeting in September, 1885, and forms a part of the author's memoir on the bones of the skeleton that will be published in the 'Challenger' Reports.

ON THE EXTENSOR PROPRIUS INDICIS DIGITI, AND ITS VARIATIONS IN  
MAN AND THE MAMMALIA.

The most extensive and trustworthy series of statistics relating to human myology contained in anatomical literature are those which have been collected by PROFESSOR GRUBER during his long period of active labor at the head of the Anatomical Institute of the Medical Academy of St. Petersburg, and which, from the number of subjects examined, and from the care with which the observations are made and recorded, may claim to be accepted as decisive of the normal condition and the frequency of occurrence of the commoner forms of variation in the several muscles examined. During the last few years Professor Gruber has made a special study of the musculature of the forearm, and his results concerning the extensor minimi digiti and the slip of the extensor carpi ulnaris, known as the ulnaris digiti quinti in man and mammals, have been published in Parts III. and V. of the *Beobachtungen aus der menschlichen und vergleichenden Anatomie*. In Part VI. he discusses in a similar manner the extensor indicis muscle, giving the results of his observations upon 600 subjects, or 1200 arms, dissected by himself, in the course of the years 1881-1884.

In all, 23 variants (1 normal and 22 abnormal forms) are recognized, 20 of which have at various times come under the notice of the author, the remaining 3 being known only from a single case of each recorded by other anatomists. In the 1200 limbs some form of variety was met with in nearly 22 per cent., the commonest being an accessory portion of the muscle going to the middle finger (extensor digiti indicis et medii), in 14 per cent.; and a splitting of the belly and tendon in nearly 3 per cent., or of the tendon only in 2 per cent. The rarer abnormalities of the muscle include a special sheath in the posterior annular ligament for the tendon in 7 arms, absence of the muscle in 6 cases (in one of these a short extensor indicis arising from the back of the carpus, and in another a short extensor indicis et medii from the lower end of the radius). An accessory head arising in the neighborhood of the back of the wrist in 4 arms, an extra slip passing to the thumb and index-finger (one form of extensor pollicis et indicis), a slip to the thumb (Gruber's extensor indicis et pollicis singularis), 2 extra slips, 1 passing to the thumb and 1 to the middle finger (extensor pollicis, indicis et medii), additional bellies to the middle and ring fingers (extensor digiti indicis, medii et annularis), or to the middle and little fingers (extensor digiti indicis, medii et auricularis), and lastly an extra belly to the ring finger alone (extensor indicis et annularis).

A supernumerary extensor indicis confined to the hand was seen in 13 cases; in 11 it arose from the base of the second metacarpal bone or exceptionally from the trapezium, and ended at the base of the first phalanx of the forefinger; in 2 it arose from the floor of the fourth compartment in the posterior annular ligament, and ended by joining the normal extensor tendon of the index. The various forms are fully and precisely described in the original, and figured in excellent plates.

The second section of the work is an exhaustive account of the comparative anatomy of the muscle in its various forms among mammalia; and it is shown that, apart from the mere splitting of the muscle and the rare varieties of which only a single specimen is recorded, nearly all the varieties that the

author has met with in man occur more or less constantly in different animals. Of the anthropoids, the gorilla has, as a rule, a simple extensor indicis proprius; the chimpanzee sometimes an extensor indicis proprius and sometimes an extensor indicis et medii; the orang usually an extensor indicis et medii; and hylobates most frequently an extensor indicis, medii et annularis, but sometimes a simple extensor indicis.

It is impossible here to follow the author through his review of the muscle in the other mammalian groups, but the following forms may be mentioned as corresponding to some of the varieties of the human muscle not represented among the anthropoids. Thus, an extensor pollicis et indicis united with the extensor indicis proprius, there being, however, no special long extensor of the pollex, is present in *Felis domestica* (compare Gruber, in *Virchow's Archiv*, lxxxvi. 483); and extensor indicis et pollicis singularis in *Dasypus*; an extensor pollicis, indicis et medii, but with absence of extensor secundi internodii pollicis, in *Hapale*, *Solenodon*, and *Didelphis*; while the short accessory extensor indicis or extensor indicis et medii has its homologue in the extensor brevis digitorum manus of many edentates—*e. g.*, *Manis*, *Alyrunecophega*, *Bradypus*, *Cholæpus*.

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#### THE VEINS OF THE SPINE.

C. WALTER (*Recherches Anatomiques sur les Veines du Rachis*; thesis presented to the Faculty of Medicine of Paris, March, 1885) does not add much to the classical description of the veins of the spine by Breschet, so far as the dorsal and lumbar regions are concerned, but in the neck his researches supplement and correct the accounts generally given in anatomical text-books in several particulars. He describes the basivertebral veins, the anterior longitudinal spinal plexuses, the posterior spinal plexus, and the dorsal spinal veins in the usual way. The communicating branches between the anterior and posterior spinal veins form rings around the nerves where they enter the intervertebral foramina, and from each ring a thick plexus is continued outward surrounding the nerve as it traverses the foramen. A finer *perigan-glionic plexus* is closely adherent to the fibrous sheath of the nerve, and into this the veins of the dura mater and the spinal cord empty themselves. Another ring is formed by the perispinal veins at the outer side of the foramen, and this constitutes the external limit of the main plexus.

In the cervical region the anterior and posterior longitudinal veins of the same side approach one another, and eventually unite in a large plexus situated in the lateral angle of the canal, occupying from one-fourth to one-third of its cavity, and being perforated by narrow openings through which the nerve roots pass. This plexus becomes more expanded opposite the atlas, and the author gives the name of *occipito-vertebral confluence* to the dense venous mass surrounding the dura mater in the neighborhood of that bone. From the confluence the perispinal venous trunks of the neck mainly take their origin, by means of a large prolongation accompanying the vertebral artery above the atlas and a smaller one below. Some smaller veins ascend from the confluence and partly enter the anterior condylar foramen, partly join the circular plexus at the margin of the foramen magnum and its continuation over the basilar process.



The perispinal veins in the neck form three main trunks, the *posterior jugular* (deep cervical of English text-books), *internal vertebral*, and *external vertebral* veins.

The posterior jugular vein is formed by the union of the following roots: (1) the mastoid vein, (2) the posterior condylar vein, (3) one or two deep occipital veins, (4) branches from the occipital foramen, (5) the large branches from the occipito-vertebral confluence, (6) branches of communication with the vertebral veins. It generally has also a direct anastomosis with the beginning of the internal jugular vein. The trunk is connected with the one of the opposite side by a cross branch behind the spine of the axis, and then descends to pass forward below the transverse process of the seventh cervical vertebra and join the termination of the vertebral vein.

The internal vertebral veins are always multiple, forming a plexus which fills up the vertebro-arterial canal. In each intertransverse space this plexus becomes divided into an anterior portion which surrounds the artery, and a posterior separated from the foregoing by the issuing cervical nerve. Inferiorly, these veins unite into a trunk which leaves the canal usually below the transverse process of the fifth cervical vertebra, and after being joined by the posterior jugular vein terminates in the well-known manner. The internal vertebral veins are derived mainly from the occipito-vertebral confluence. They receive, as they descend in the neck, (1) all the veins of the anterior surface of the cervical spine, which form a considerable plexus, especially in front of the second or third vertebræ; (2) the dorsal spinal veins of the neck; (3) branches of anastomosis with the posterior jugular; and (4) branches of anastomosis with the intraspinal veins, through the plexus of the intervertebral foramina.

The external vertebral vein is a vessel that begins between the atlas and axis by offsets from the internal vertebral veins and the occipito-vertebral confluence, and descends over the articular processes to join the posterior jugular vein at the level of the fourth or fifth vertebra.

There are very numerous and free communications between all these veins, and they present many variations in the details of their arrangement. The external vertebral vein is often wanting, being replaced by a number of irregular branches passing from the internal vertebral to the posterior jugular vein.

A general view of the veins of the back of the neck shows that they are disposed (as has been pointed out by Foucher) in four considerable plexuses beyond the scanty subcutaneous network, viz.: (1) between the trapezius and splenius, the branches of exit passing to the occipital and external jugular veins; (2) between the splenius and complexus, emptying itself into the transverse cervical vein; (3) between the complexus and transverso-spinalis, having the posterior jugular vein for its afferent trunk; and (4) the dorsal spinal between the transverso-spinalis and the arches of the vertebræ, opening into the internal vertebral veins. Many cross branches pass through the muscles and connect the different layers. The author states, however, that he has not yet been able to confirm all the details of Foucher's description.

The typical disposition of the spinal veins is represented in six diagrammatic figures.

## PHYSIOLOGY.

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 UNDER THE CHARGE OF

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 COAGULATION OF THE BLOOD.

C. HOLZMANN gives a critical review of the literature on this subject, and the details of some experiments of his own performed in the pharmacological laboratory of Prof. Dogiel, of Kasan, from which he obtains results, on the whole, confirmatory of the views of Hammarsten, viz., that coagulation is essentially a fermentive process, the fibrinogen undergoing a change which results in the separation of an insoluble substance, rich in oxygen—fibrin—from another kind of albumen, poor in oxygen, which remains in solution but in less quantity. The following are his conclusions:

(1) A certain globulin can be prepared from horse's blood identical with fibrinogen. It does not coagulate at ordinary room-temperature or on the addition of distilled water.

(2) Typical coagulation may be produced in this solution of fibrinogen by treatment with any of the following: Defibrinated blood; blood serum; watery extract of the alcoholic precipitate of the albumens of blood serum or egg albumen; products of decomposition of boiled egg albumen; the passage of a prolonged current of oxygen.

(3) Fibrin ferment is not peculiar to the blood, but occurs also among the products of decomposition of albumen.

(4) That fibrin is the result of a process of oxidation occurring in the fibrinogen is supported by the facts; and typical coagulation follows the passage of a current of oxygen through the solution of fibrinogen; that coagulation is ordinarily a fermentive action; and in the coagulation of the blood the fermentation and the oxidation cannot be separated one from the other.

(5) When a dog is bled to death, the last blood that flows coagulates more quickly than the first, though there is no appreciable increase in the amount of fibrin formed.

(6) The well-known fact that venous blood coagulates less quickly than arterial.—*Archiv für Anatomie und Physiologie*, July 20, 1885, p. 210.

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 BRONCHIAL MOVEMENTS.

PROF. ROY and DR. GRAHAM BROWN made a preliminary communication to the Physiological Society (*Journal of Physiology*, July, 1885) of an investigation on the above subject, which still was occupying their attention.

They introduced into the bronchus a sound made of a bent glass tube, at the distal extremity of which was a bag of animal membrane distended with air, so as to occlude the air-passage in which it lay. The proximal end of the glass tube was in connection with a special recording apparatus. Any change in the capacity of the branches of the occluded bronchus was thus graphically recorded.

Stimulation of the uncut vagus caused contraction of the bronchi, if the other nerve be intact, but dilatation if the nerve of the other side be previously cut. Section of one vagus caused dilatation of the bronchi of the lung of that side. Stimulation of the peripheral end of the cut vagus caused contraction more marked than when both nerves are intact. Stimulation of the central end of the cut nerve sometimes caused contraction, but in a much less marked degree than the other end, while in other cases "powerful expansion" followed. Cessation of the artificial respiration causes expansion of the bronchi while the vagi are intact, but has no effect when the nerves are cut. Both atropine and nicotine seem to paralyze the effect of the vagus on muscles of the bronchi. They conclude that the vagi are the only means of communication between the cerebro-spinal centres and the bronchial muscles, and that these nerves carry impulses both to and from the bronchi, tending either to contract or expand the tubes. They give no explanation of the probable uses of this motor mechanism of the bronchial tubes.

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#### THE HEART'S FIRST SOUND.

Having failed to find cessation of the heart's first sound on clamping the veins, or its immediate reappearance in its fullest intensity when the vessels were set free, YEO and BARRETT examined with a flexible binaural stethoscope the ventricles of a cat and two dogs after having removed them from the animals. In each case the empty ventricle gave a distinct sound. In the dogs the sound could be heard after the auricles were severed from the ventricles, and they conclude that "a definite and characteristic tone, similar in quality to the first sound, is produced by the heart muscle under circumstances that render it impossible for any tension of the valves to contribute to its production." This fact was demonstrated at the meeting of the Physiological Society on 9th of May.—*Journal of Physiology*, July, 1885.

In the same number of this *Journal* (p. 287) HERROUN and YEO call attention to the inadequacy of the proofs that the so-called muscle tone of skeletal muscles depends on a number of successive, fused contractions like artificial tetanus, and to the fact that any regular vibrations which are too slow—*i. e.*, too deep in tone—to be heard as a musical note, give the sensation of a tone identical with the proper resonant tone of the membrana tympani (Helmholtz). They then examined with a flexible binaural stethoscope both human and cat's muscles, and found that with the slowest rates of stimulation the quality of tone could be heard. They conclude:

(1) That a single contraction of a skeletal or heart muscle gives rise to motions or vibrations which evoke the resonant tone of the membrana tympani in the same manner as the tetanic or voluntary contraction.

(2) That the tone heard in voluntary contraction is no evidence of distinct or regular vibrations in the muscle, but merely of motions, regular or irregular, which produce the vibration of the membrana tympani.

(3) That the tone heard in voluntary contraction is, therefore, no evidence of regular discontinuity of natural nerve impulses, but simply depends upon trembling movements due to variations, either of force or distribution of stimulation.

(4) That the objection to the first heart sound's being a muscular sound

because the systole of the heart is a single contraction is not valid, since the single contraction of a muscle causes motions or vibrations which call forth the resonant tone of the ear.

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#### THE DEPRESSOR NERVE.

In studying the action of this nerve and the effect of variations of blood pressure on the heart, considered as a sensory organ, PROFESSOR SEWALL (Michigan) and DR. STEINER came to the conclusion that the depressor nerve has other important functions beside the well-known one established by the classic work of Ludwig and Cyon, viz., of conveying from the heart to the vasomotor centre impulses which inhibit that centre, and by allowing the visceral vessels of the abdomen to expand, produce a depression in the general blood pressure, and thus relieve intracardiac tension.

They found that when the carotid arteries are clamped the rise in blood pressure, though greater than that which follows clamping of other large arteries not supplying the brain, was inconsiderable when compared with the rise that followed the same operation after previous section of the depressor nerves, in which case the pressure was observed to rise 30 per cent. to 75 per cent. above the normal. This is explained by supposing the depressor nerves while intact to be able, by their reflex inhibitory influence on the abdominal vascular area, to counteract almost completely the tendency to high pressure, which follows the stimulation of the vasoconstrictor centre in the medulla, by the local deprivation of blood consequent upon the clamping of the carotid. Section of the vagus or sympathetic trunks gave negative or uncertain results.

Varying the intracardiac pressure by compressing the vena cava inferior with and without previous section of the depressor nerve, they found that increased pressure in the heart was followed by a slowing of the rhythm when the depressor was intact, but not when it was divided. From this they conclude "that high arterial blood pressure, which in this case means correspondingly low venous pressure, stimulates the endings of the depressor nerves and brings about reflex by a slowing of the pulse-rate, even though the cardio-accelerator apparatus may be simultaneously excited."—*Journal of Physiology*, July, 1885.

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#### GLYCOGEN.

In a lengthy dissertation (*Archiv für Microscop. Anat.*, Aug. 17, 1885, pp. 259-404), chiefly historical and critical in character, DR. DIETRICH BARFURTH gives the details of the exact amount of work—mostly confirming the results of others—which was executed in the Anatomical Laboratory at Bonn. He depends on the histochemical examination of the tissues by a special method for the determination of the amount of glycogen they contain. Small pieces of the tissues to be examined are placed in absolute alcohol immediately after their removal from the dying animal. The section made from the tissues thus hardened are stained with (1) a solution of iodine in potassic iodide, (2) iodine glycerine, or (3) iodine gum (Ehrlich). Thus treated, the glycogen of muscle turns violet, that of the liver mahogany-brown. By controlling the results thus obtained by other methods of determining the presence of glycogen, he was satisfied that the absence of the characteristic color shows with absolute certainty the absence of glycogen.



He examined a great variety of animals, and in all found glycogen widely distributed throughout the tissues, being in all active protoplasmic cells, but not in the nuclei. The fact that glycogen is a normal product of the chemical changes going on in all cells is insisted upon, and a share in its production given to all tissues, though the liver is admitted to have the most important part to play in this action, because it has the best opportunity of nutritive excess.

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#### TRYPSIN FORMATION.

DR. S. LEWASCHEW, working under Heidenhain's direction, performed a series of experiments with the object of testing whether zymogen is the usual precursor of trypsin (Heidenhain), or whether finding zymogen is the exception, and whether trypsin is commonly present in the living cells of the pancreas, as stated by Weiss. He insists on the necessity of using glycerine free from water, and as great dispatch as possible in making the extract of the gland. In the first series of 38 dogs not specially fed for the experiment, 2 gave active extracts both when made immediately after death and after 24 hours, indicating the presence of trypsin in the fresh pancreas; in 27 cases the extracts of the fresh gland contained no trypsin, though the later extract contained a considerable quantity; and in 9 cases neither the fresh extract nor the gland kept for 24 hours was effective in digesting fibrin. In the second series of experiments the pancreas was excited to activity by food (9 cases) or the injection of pilocarpin into the blood, which produced intense action of the gland (14 cases). In every instance, the extract of the fresh gland was free from trypsin. In the third series the opposite condition was examined, the gland being rested by abstinence from food for various periods (20–120 hours). In these 14 animals no trypsin existed in the fresh extract. After the shorter periods of starvation, the extract made 24 hours after death was very rich in trypsin, but after the longer periods (120 hours' starvation) no trypsin was to be detected, although the granules generally believed to be associated with its presence were present in great quantities in all parts of the cells. These cannot then be the material for the formation of the ferment. The granules and ferment probably appear and disappear together under normal conditions, but in prolonged periods of inanition the granules which are the visible carriers of the ferment persist after the latter has disappeared.—*Archiv für die gesammte Physiologie des Menschen und der Thiere (Pflüger)*, Sept. 10, 1885.

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#### CEREBRAL CORTEX OF NEWBORN ANIMALS.

DR. JOSEF PARETH attempts to decide the question whether the central cortex only becomes capable of excitation ten days after birth (Soltmann); or was excitable at or even before birth (Tarchanoff). In the case of dogs, varying in age from eighteen to forty-eight hours, he got only one negative result from the animals employed, and concludes that even in the first days of extrauterine life the cerebral cortex of dogs is capable of excitation. The experiments giving an opposite result, he thinks, were vitiated by the use of anæsthetics, which have so powerful an influence on animals at this time of life.—*Arch. f. d. gesam. Physiologie*, Oct. 13, 1885.

MATERIA MEDICA, THERAPEUTICS, AND  
PHARMACOLOGY.

UNDER THE CHARGE OF

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PHILADELPHIA.

## PHYSIOLOGICAL ACTION OF AMERICAN ACONITES.

Several agents of considerable promise, belonging to our indigenous materia medica, have been investigated during the last quarter and previously, in the laboratory of experimental therapeutics of the Jefferson Medical College of Philadelphia.

Under this title there appears in the last issue of Prof. Lloyd's *Drugs and Medicines of North America*, a preliminary note of investigations made by DR. BARTHOLOW into the actions of *Aconitum Fischeri* and *A. uncinatum*. As the latter proved to be inert, further reference to it is unnecessary. The former, however, was ascertained to be a very interesting substance. The experiments were made on cold- and warm-blooded animals (frogs and rabbits), and the preparation used was a concentrated fluid extract prepared by Prof. J. U. Lloyd.

The rate at which it moved to affect function was more rapid in warm- than in cold-blooded animals, but the results of the actions were the same.

On the mucous membrane of the mouth *Aconitum Fischeri* acted as *A. napellus*, causing the characteristic numbness and tingling, which, as Squibb has elaborately shown (*The Ephemeris*, August, 1885), is quite distinctive of *A. napellus*. An experiment made by Dr. Bartholow yielded these results:

"To determine the effect of the *Aconitum Fischeri* on the mucous membrane, I placed a large drop near the extremity of my tongue. In a minute the tingling which is so characteristic a symptom of *Aconitum napellus* was perceived, and it then rapidly increased, but did not attain its maximum for an hour. I then tested the state of the sensibility of the tongue at this point with the *æsthesiometer*, and found that the perception of the two points was as acute as at the unaffected parts of the mucous membrane. The pain-sense was as little affected as the tactile sense. Pricking with the point of the *æsthesiometer* caused as acute a sense of pain in the area occupied by the tingling as elsewhere. At the end of two hours the tingling was hardly abated in any degree."

The following are the conclusions reached by the physiological investigation:

"*Aconitum Fischeri* is a paralyzer of motility, but it does not impair the contractility of muscles, or the irritability of the motor nerves. Its action is central, not peripheral.

"It does not affect sensibility or the reflexes until all manifestations of motor activity cease.

"It does not paralyze the heart, but by removing the inhibition permits a more active movement of the organ. It paralyzes most completely the vagus, so that the strongest stimulation causes no response.

"Death ensues by paralysis of the respiration, the heart continuing in action for some time after respiration has ceased."

Comparing the actions of *Aconitum Fischeri* and *A. napellus*, Dr. Bartholow concludes that

"Notwithstanding the botanical affinities, and, in some respects, the physiological, there are marked and fundamental differences between them.

"*Aconitum napellus* affects sensibility, and lowers the irritability of the sensory nerves. *Aconitum Fischeri* does not destroy the tactile or pain-sense, although it causes the characteristic tingling, and it does not affect the irritability—the power to perceive and transmit peripheral impressions—of the sensory nerves.

"*Aconitum napellus* paralyzes the end-organs of the motor nerves, the trunks, and ultimately the motor portion of the cord. *Aconitum Fischeri* does not affect the contractility of muscles, or the irritability of the motor nerves, but paralyzes the motor centres of the cord.

"Both cause death by paralysis of respiration.

"They affect the heart in opposite modes: *Aconitum napellus* stimulates the vagus roots, and slows the heart, while *Aconitum Fischeri* paralyzes the vagus and increases the force and number of the cardiac pulsations. *Aconitum napellus*, after a brief stimulating action, paralyzes the vasomotor centre in the medulla, and greatly lessens the blood pressure. *Aconitum Fischeri* rather stimulates the vasomotor centre, and does not lower the blood pressure."

An antagonism of actions between *Aconitum Fischeri* and strychnine was, also, ascertained to exist, but the extent of this remains to be determined by further experiments.

The therapeutical powers of the American aconite can be readily deduced from its physiological actions. Cases in which spasm is a predominant feature, especially of the respiratory system, and in cardiac affections characterized by exaltation of the inhibition, are those most likely to be benefited by *Aconitum Fischeri*.

#### GRINDELIA ROBUSTA: EXPERIMENTS TO ASCERTAIN ITS PHYSIOLOGICAL ACTION.

DR. JOHN A. BUFFINGTON, in a thesis for the Doctorate which received the "Lea Prize," relates an elaborate investigation made in the laboratory of experimental therapeutics of the Jefferson Medical College, under the supervision of Dr. A. P. Brubaker, Demonstrator. We give a summary of the conclusions arrived at by Dr. Buffington:

*Grindelia* was found to be not actively toxic. The lethal dose of the fluid extract, the preparation used in the experiments, was 3ij–3iij for rabbits weighing twenty-eight ounces to thirty-two ounces; and ℥x–℥xv for frogs weighing one ounce; and the time required to cause death was one to three hours in the former, and a half to one hour in the latter.

*Grindelia* first lessens, then destroys sensibility, the action beginning in the peripheral—the end-organs—then involving the trunk of the nerves, and ultimately the spinal cord. Motility is affected in the same order, the paralysis beginning in the nerve terminals, then involving the nerve-trunks, and finally the motor centres in the spinal cord.

The heart is slowed, because of an increase of inhibition due to stimulation

of the cardiac inhibiting centre, and the blood pressure is raised, chiefly by stimulation of the vasomotor centre in the medulla. The respiration is increased in frequency by an action of the agent on the respiratory centre, and, also, on the terminals of the pneumogastric in the lungs. Toward the end, the respiration becomes slower, and is jerky in character, and death ensues by arrest of respiration, the heart continuing in action some time longer.

The cerebral effects of grindelia are quite pronounced. A condition of narcosis, more or less profound, ensues, as the effects of the drug develop. This action appears to be due to a direct impression made on the cells of the cerebral lobes.

A marked increase of the urinary secretion was noted in all the animals experimented on. As some constituents of the drug appear in the urine [the resin?] a direct action on the renal structures may be admitted. The increase in the blood pressure is another factor—and, it may be, the chief one.

This investigation throws light on the nature of the curative effects exerted by grindelia in asthma, for the relief of which, hitherto, it has been chiefly used. The cerebral, the cardiac, and the renal actions, however, suggest its use in other maladies.

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#### FLUID EXTRACT OF CAMELLIA (C. THEA) AND HYDROBROMATE OF HYOSCINE.

These preparations have been made the subject of physiological and clinical investigations by DR. JUDSON B. ANDREWS, Superintendent of the State Asylum for the Insane, Buffalo, N. Y. (*American Journal of Insanity*, October, 1885).

The preparation of camellia employed by Dr. Andrews in these investigations, was the fluid extract of Squibb. The active principle was *caffeine*. The volatile oil which it contains may contribute in some slight degree to the results. The physiological study consisted in ascertaining the effects on the heart and circulation of man, the sphygmograph being used to demonstrate the character of the action. Although very limited in scope, the experiments are not without value, confirming, as they do, the previous observations on the action of caffeine. According to Squibb (*The Ephemeris*, 1885), each fluid-drachm of camellia extract yields 1.72 grains of caffeine. The doses administered by Dr. Andrews ranged from 3j to 3iij; the first experiments were *in propria persona*, and subsequently various subjects affected with cardiac lesions were submitted to experiment. The results corresponded to those heretofore obtained from caffeine, but Dr. Andrews finds that "two grains of caffeine in tea in its natural condition are equivalent to three grains of caffeine extracted from the tea and used as caffeine." If this be confirmed, the fluid extract of camellia will prove more efficient, relatively, than caffeine; and, as it is more convenient and cheaper, will come to be preferred for medicinal use.

The effects of camellia were quite uniform. It reduced the pulse 10 to 24 pulsations per minute, increased its force and volume, and raised the arterial tension. The effects began in a half hour to an hour after its administration, were maintained at the maximum about an hour, and then began to decline, the normal being restored in about three hours.

HYOSCINE.—Dr. Andrews made a series of observations on himself, on an attendant in the hospital, and on several patients, with the *hydrobromate of*



*hyoscine*, a secondary product of *hyoscyamine*. As in the experiments with *camellia*, the sphygmograph was used to record the impressions made on the pulse. In doses ranging from  $\frac{1}{200}$ th to  $\frac{1}{3}$ d grain, it was found to lessen the pulse 10 to 24 beats per minute; and, if we may depend on the accuracy of the sphygmographic tracings, to lower the arterial tension. It proved to be decidedly hypnotic in its action, and it produced no unpleasant after-effects—no headache, nausea, or other disturbance, except an unpleasant dryness of the fauces and disordered vision.

Therapeutically studied, Dr. Andrews came to the following conclusions:

"We report in all 22 cases in which *hyoscine* has been employed. Of these, 11 are of *melancholia*, 6 of *acute mania*, 1 of *chronic* and 1 of *paroxysmal mania*, 1 of *mania with epilepsy*, 1 of *dementia*, and 1 of *acute chorea*."

"The limits of the doses were from the  $\frac{1}{200}$ th to  $\frac{1}{3}$ d of a grain, in all of which I found it a perfectly safe remedy. It was given by the mouth in twenty of the cases, and in two by hypodermatic injection. . . The physiological effect of the drug was experienced in from fifteen minutes to two hours, but the average time was less than an hour. The pupils were dilated in most of the cases, but the disturbance of vision and the dryness of the fauces, or the inhibition of muscular movements, were only complained of in two cases mentioned, but in many of them there was such a degree of mental disturbance that the absence of complaint is of little value in arriving at a knowledge of the existence of those unpleasant effects. There was no nausea, and in the few cases in which it was given sufficiently long to produce the results, there was no disturbance of the appetite with the consequent loss of flesh, as is sometimes experienced in the continued use of *hyoscyamia*. There is also less disturbance of the vasomotor system than is found in the use of that alkaloid. It would seem from the experiments that it is a powerful sedative to both the cerebral and spinal systems, and from the success attending its use, and for the reasons stated above, it would seem justly entitled to a high position in the list of hypnotic remedies, and will, I think, surpass in favor the sister alkaloid of *hyoscyamus*."

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#### THERAPEUTIC USE OF COCAINE.

The interest aroused by the discovery of the local anæsthesia induced by cocaine is but little abated, and communications on the subject continue to appear.

The effects of cocaine in the treatment of neuralgia, when injected in the neighborhood of the painful nerve, have not been universally admitted, but the evidence that its local action is effective is accumulating. In illustration of this point we quote a recent experience of Dr. MAX SCHNEIDER (*Centralblatt für die gesammte Therapie*, August, 1885, p. 363). A patient had had three attacks of neuralgia of the fifth, each one increasing in severity. The first seizure was cured by quinine; the second, after six months of persistent treatment, was finally arrested by morphine and iron; and the third, treated by localized injections of salicylate of cocaine, was relieved at once, and after eight injections on the sixth day there was no longer any pain—only some tenderness to pressure at the point of exit of the nerve, which was removed by three applications of galvanism. The first dose administered

was four decigrammes, equivalent to about six grains, and this gave complete relief, substituting a sense of comfort for the pain before experienced.

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#### TOXIC SYMPTOMS FROM THE USE OF COCAINE.

The use of cocaine is not without ill results, and there is increasing evidence that unpleasant accidents sometimes occur. The writer has observed headache, vertigo, and faintness, after the local use of even small doses.

In a recent issue of the *Lancet* (Nov. 7, 1885) there is an editorial note calling attention to toxic symptoms observed by Knapp, Mayerhausen, of Freiburg, Reich, Bellyarminoff, of St. Petersburg, and others. In the case narrated by Mayerhausen, an abstract of which we find in the October issue of *Centralblatt für die gesammte Therapie*, p. 457, less than one per cent.—so diluted was the solution by a copious secretion of tears—caused, when instilled into the conjunctiva, headache, nausea, constriction of the throat, weakness of the tongue, impaired speech, and other severe symptoms, lasting twenty-four hours.

DR. SPEAR, Medical Inspector U. S. Navy (*The Medical Record*, Nov. 15, 1885), reports a case of cocaine poisoning, in which the symptoms simulated opium narcosis. There were the characteristic coma and insensibility, contracted pupils, feeble pulse, cyanosis, and cold perspiration. The amount taken was ten grains, but the patient had swallowed an unknown quantity of whiskey. Injections of atropine, strong coffee, flagellation, and walking, were the measures resorted to under the impression that the condition was due to opium.

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#### HYPNOTICS.

In a series of lectures entitled "Conferences de Thérapeutiques," DUJARDIN-BEAUMETZ has taken up various therapeutical subjects. In a recent lecture, which appears in the *Bulletin Générale de Thérapeutique*, for Oct. 30, 1885, he discourses on the "new hypnotics." We transcribe some of his observations.

Chloral appears to act on the heart, and, as has been affirmed by Gubler, it is a heart poison in large doses. In all febrile diseases of a congestive form, chloral is far superior to opium for the production of sleep; as in typhoid, pneumonia, and alcoholic delirium. On the contrary, this remedy is contra-indicated in cardiac affections, especially in troubles of the aortic orifice; here opium is much better. Chloral is a most useful remedy in certain forms of intoxication, especially in poisoning by strychnine, in delirium tremens, and uræmic convulsions, but in these it is still inferior to *paraldehyde*.

The sleep caused by paraldehyde is analogous to that produced by chloral. It is usually calm, but in some instances the sleep is preceded by excitement. The assertion of Quinquad and Hénocque that it acts on the hæmoglobin, producing methemoglobin, has been disproved by Hayem, who has shown that it does not affect the coloring matter of the blood. It is eliminated almost entirely by the lungs, but when large doses are given some portion escapes in the sweat.

One of the most interesting facts regarding the action of paraldehyde, is its antagonism to strychnine, which was first demonstrated by the Italian physi-

cians, and since confirmed by Coudray. Dr. Dujardin-Beaumetz relates some experiments of his own proving this antagonism. Ether, chloral, chloroform, have similar powers in this respect. They all act, as does paraldehyde, on the cells of the nervous matter. We know that strychnine, also, stimulates the cells of the cerebro-spinal axis. It consequently happens that when the nerve elements are acted on by one agent, they will not receive an impression from another, and thus in a strictly physiological and scientific manner can be explained the antagonisms of these several remedies and strychnine.

Compared with chloral, paraldehyde has these advantages:

It is less irritant, and better supported by the stomach. It is not a heart poison. It is a more efficient antidote to strychnine. But it has less analgesic action, and less power to relieve pain than chloral, and hence when insomnia is caused by pain the latter is preferable, and morphine is still more efficient. In nervous insomnia, in that due to the abuse of alcoholic drinks, paraldehyde is much superior to chloral. Especially is paraldehyde most useful in the different forms of mental disorder, as Drs. Kéraval and Nerkam have shown by numerous trials. They have also shown that it is a valuable hypnotic in certain cases of insomnia with the excitement occurring in the course of some cerebral affections, in the convulsive neuroses, and especially in epileptic crises, and in the multiform manifestations of hysteria. Dr. Dujardin-Beaumetz has also treated many cases of morphiomania by paraldehyde, giving three or four grammes a day (forty-five to sixty minims). It does not appear to lose its effects by repetition, since the same results have been obtained through months of treatment.

MR. G. F. HODGSON, an English surgeon, has had experiences with paraldehyde which supplement the observations of Dujardin-Beaumetz (*The British Medical Journal*, July, 1885). His report is based on the experience gained from the use of about two quarts of the agent in a variety of cases. Mr. Hodgson finds it to be a hypnotic of great value, in that it produces sleep like the natural state, promptly, and without any unpleasant after-effects. He regards it as the most appropriate hypnotic in the insomnia of gout, in mania, hypochondriasis, delirium tremens, migraine, and in the wakefulness of ordinary diseases. His prescription is as follows:

R.—Paraldehyde . . . . .	3j.
Spiriti chloroformi . . . . .	℥xv.
Pulv. tragacanth. comp. . . . .	℥j.
Syrp. aurantii . . . . .	℥iv.
Aquam . . . . .	ad. 3iij.—M.

This dose is sufficient in the milder cases, but must be repeated in the more severe.

#### MENTHOL AS A SUBSTITUTE FOR COCAINE.

The Japannese for two hundred years have used *menthol* as a local anæsthetic. They obtained it from the essence of mint, by refrigeration, menthol crystallizing out. Michigan mint, it is said, furnishes a notable quantity of menthol, and to this it is proposed to give the name of *pipmenthol*.

Recently DR. ROSENBERG, of Berlin, has sought to substitute menthol for cocaine. Having observed that a solution of cocaine, applied to the tongue,



caused a sensation of coldness, it occurred to him that probably some other substances having this effect might similarly lessen sensibility. With this view he applied a compress of ether to the swollen mucous membrane of the nares. The patient experienced a severe burning sensation at the point of application, but immediately he breathed more easily, the swelling of the inferior turbinated bones lessened, and the sensibility of the part was reduced. This effect lasted about a quarter of an hour. By this procedure, he caused in two cases the reflex phenomena to disappear—in one, a suborbital neuralgia; in both, very pronounced oppression of breathing.

Seeing that the cold produced by the ether did not sufficiently lessen sensibility, and recalling that the menthol crayon applied to the skin in a case of migraine caused a vivid sensation of cold, he associated the two agents, and used a solution of twenty grammes of menthol in one hundred grammes of ether. The result was more favorable. Immediately after the application of the ethereal solution of menthol, the mucous membrane becomes pale, as is the case with cocaine, after which the swelling of the turbinated bones diminishes, and the sensibility disappears.

In seventy observations, Dr. Rosenberg saw neither inflammation nor cauterization of the mucosa. To ascertain whether the anæsthesia produced by the ethereal solution of menthol corresponded to that due to cocaine, he applied to the same individuals a five per cent. solution of the latter, and he found that the sensations of the patient were the same, and the effects were alike in both cases.

The action of the menthol lasts about a quarter of an hour to half an hour, sometimes for an hour and a half. By repeated applications the anæsthesia may be kept up for two or three hours.

Rosenberg also employed alcoholic and oleaginous solutions of menthol, from 20 to 50 per cent., for the relief of pain. These concentrated solutions sometimes caused a sensation of heat, followed, however, by an agreeable coolness. An ethereal solution of menthol of 20 per cent., he ascertained, also induced anæsthesia of the mucosa and tumefaction of the erectile tissue, and the same diminution of sensibility followed applications to the fauces, but complete anæsthesia, lasting from one to three minutes, resulted when the stronger solutions were applied. This strength of application was found useful when laryngoscopic examinations and cauterizations were to be made. For application to the larynx itself, Rosenberg found a 10 per cent. solution strong enough, since when this strength was exceeded cough was produced.

DR. BARATOUX (*Le Progrès Médical*, 1885, p. 199), repeating the methods of Rosenberg, arrived at results somewhat different. After some trials with alcoholic and ethereal solutions, on the recommendation of M. Houdé, pharmacist, he resorted to petrobasaline as the solvent, for this was found to be less irritating than ether and alcohol. This solution applied to the skin caused, in a few minutes, a sensation of coolness, and on the tongue smarting also, which persisted for several minutes.

Solutions sufficiently concentrated, from 35 to 50 per cent., caused a marked diminution of sensibility, but not as great as that induced by the application of a 5 to 10 per cent. solution of cocaine. In various cases in which both local anæsthetics were used to lessen sensibility, all the patients on whom the trials were made preferred the effects of cocaine, and suffered such disagree-



able sensations from the application of menthol as to prefer not to repeat the experience.

In acute tonsillitis, Dr. Baratoux did not obtain the good results which Dr. Rosenberg had reported, and the smarting caused by menthol was so considerable as to counterbalance any good effect.

In the nasal passages the action of menthol is less disagreeable, especially if rapid expirations are practised; the smarting is less intense, and the sensation of coolness more agreeable; the respiration becomes easier, and the swelling of the turbinated mucosa lessens. On the conjunctiva menthol has a very irritant action, and although it induces a decided anæsthesia, the effect of cocaine is both more pleasant and thorough.

Baratoux has also employed the solutions of menthol in alcohol, and petro-baseline, in the treatment of polypi of the nose and ear. As respects the ear, the pain produced by the application was great, and no diminution of sensibility resulted; but in the case of extraction of nasal polypi there was an obvious lessening of the sensibility.

Dr. Baratoux concludes that the menthol solutions are more effective in inducing anæsthesia of the nasal passages, especially when the patient rapidly inspires and expires; that they may be employed in some cases with advantage; but that they do not equal cocaine either in respect to the diminution of sensibility or the relief of local congestion.

The chief motive of Dr. Rosenberg appears to have been to find in menthol a cheaper local anæsthetic than cocaine, but since the decline in the price of the latter there is less necessity for obtaining substitutes.

It appears, further, that coca grows in such abundance, and can be cultivated with so much facility, that the needs of the world will be readily supplied in the future.

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#### MENTHOL AND CHLORAL CONES.

M. MAYER, in a recent communication to the Paris Therapeutical Society (*Revue de Thérapeutique*, October, 1885), says he has found a mixture of oil of peppermint and ether a good local application for the relief of superficial pains. He proposes, also, the following cones for topical use:

Chloral	.	.	.	.	.	.	.	gr. 0.50
Menthol	.	.	.	.	.	.	.	" 0.50
Cacao-butter	.	.	.	.	.	.	.	" 1
Spermaceti	.	.	.	.	.	.	.	" 2

These are held by a compress against the painful part.

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#### BISMUTH AS AN ANTISEPTIC.

Bismuth as an antiseptic dressing for wounds, and for gastrointestinal disorder due to the action of minute organisms, and in the course of which ptomaines are produced, is attracting considerable attention. In an elaborate paper, entitled "*Untersuchungen über die toxischen und therapeutischen Wirkungen des Wismuths*," which appears in the *Archiv für experimentelle Pathologie und Pharmacologie*, for October, 1885, DR. WLADIMIR STEINFELD gives a complete account of the actions and uses of bismuth. He precedes

the study of the physiological effects by an historical summary, which closes with the observations and experiments of Kocher (*Volkmann's klin. Vorträge*, No. 224) and of Petersen (*Deutsch. med. Wochenschrift*, 1883, No. 25, p. 367). Experiments were made on frogs, mice, rats, cats, and dogs. The systemic action was referred to the medulla oblongata, and consisted, first, in exaltation of function (heightened reflexes, tonic rigidity of the muscles, etc.) similar to the effects of picrotoxin and salts of barium, followed by depression of function, failing respiration, general muscular paralysis, lowering of the blood pressure, and arrest of the heart's action, by paralysis of the vasomotor centre in the medulla, and of the cardiac motor ganglia.

In chronic poisoning in warm-blooded animals, there ensued loss of appetite, diarrhoea, tenesmus, stomatitis, anæmia, lowered temperature, muscular cramps, and heightened reflexes, followed by paralysis, feeble circulation and respiration, and failure of the heart by paralysis of the cardiac motor ganglia. The post-mortem appearances consisted in an intense pigmentation of the mucosa, especially of the cæcum and vermiform appendix due to the deposit of sulphide and chloride of bismuth; fatty degeneration and necrosis of the epithelium of the intestinal and renal mucous membrane; blackish discoloration of the intestinal lymph vessels, and staining of the lymph corpuscles, etc.

As regards its therapeutical properties as a dressing for wounds, Steinfeld holds that it plays rather a mechanical part as a protective and a means of preventing absorption, and that it is rather doubtful as an antiseptic.

M. GOSSELIN (*Revue de Thérapeutique*, October 1, 1885) has found the subnitrate of bismuth dressing very efficacious in the treatment of wounds. It causes an immediate diminution of the inflammatory symptoms, arrests the sanguineous congestion succeeding operations, and induces cicatrization without suppuration. The hæmostatic action may be explained by the small quantity of nitric acid set free, which coagulates the albumen of the blood. Experience has shown that bismuth is an antiseptic, and thus the absence of suppuration may be accounted for.

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#### QUININE IN THE TREATMENT OF WHOOPING-COUGH.

DR. SAUERHERING, of Stettin (*Deutsch. med. Wochenschrift*, 1885, No. 37), proposes a method of treating whooping-cough with quinine, which he has found to cure the disease in from fifteen to twenty days. He gives the remedy in relatively large doses. For nursing children, the doses are 4 to 7 centigrammes (gr. ss-gr. j); for the second year, 7 to 10 centigrammes (gr. j-gr. jss); for the third to the fourth year, 10 to 15 centigrammes (gr. jss-gr. ij); for the fifth to the sixth year, 15 to 20 centigrammes (gr. ij-gr. iij); and from the seventh to the ninth year, 20 to 25 centigrammes. Adults receive 50 centigrammes (gr. viij). These figures are not absolute, but serve to indicate the probable amount necessary, which may be varied according to the constitution and development of the affected individuals. The medicament is administered as follows: ten powders or packets of the quinine are prepared and given, one in the evening, and three each day for the three following days. Then, after an interval of three days, by the same mode of administration, the same number are given, beginning on the evening of the third day.

Another interval of three days, and another administration in the same way follows. In this way, thirty powders are given in sixteen days. By this time the whooping-cough has usually disappeared. But in some rare cases the disease proves unusually obstinate; in that event, ten more packets are administered. Usually, a notable diminution in the number of the paroxysms is observed after the first ten packets have been administered and the three days' interval passed. But it sometimes happens that the vomiting does not cease, and then the parents of the sufferer become impatient. Habitually, after the second period of administration of the quinine and the interval, the cough lessens in the proportion of 28 to 16—even to 14; vomiting rarely occurs; the subconjunctival hemorrhages disappear, and it is only occasionally in the night that there will be paroxysms of coughing of a severity comparable to those at the onset. During the third period of the medication, often before the last day, the number of paroxysms of coughing fall to one or two, and their total disappearance soon happens. If the cough ceases during the second period of medication, it is better, that success may be assured, to administer the remedy for the third. If it happens that the packets are vomited, in part or in whole, during the first period, others should be at once given.

The statistics given by Dr. Sauerhering quite prove the success of this method of treating whooping-cough.

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#### THE TREATMENT OF DIPHTHERIA WITH OIL OF EUCALYPTUS AND OIL OF TURPENTINE.

There is increasing evidence of the good effects obtained from the oils of eucalyptus and turpentine in the treatment of diphtheria. In a communication to the *Gazette Médicale de Nantes*, No. 11, 1885, DR. BARTHELEMY explains the method as carried out in two isolated wards of the children's hospital, and gives the results.

On the stove are placed two large, deep vessels, one containing boiling water having a handful of eucalyptus leaves thrown in, and the other a mixture of tar and essence of turpentine. When the temperature does not admit of the use of the stove, an alcohol lamp is placed under a large saucepan half full of water, to which essence of turpentine and eucalyptus leaves are added, in sufficient quantity to saturate the air of the apartment with the fumes and the vapor of water. In this way the patients breathe an atmosphere thoroughly balsamic and antiseptic. Tar, and especially essence of turpentine, have been added to the eucalyptus since the publication of Dr. Conëstou's observations showing the remarkable germicide properties of air ozonized by turpentine. According to Koch, turpentine in solution (1-75000) arrests the development of the spores of charbon. Since 1880, Drs. Bosse and Satlow have employed the turpentine treatment exclusively in diphtheria. They have, it is true, used a different method of administering the remedy—giving internally as much as a teaspoonful to a tablespoonful daily, according to age (*Bull. Générale de Thérapeutique*, 1883). The plan Dr. Barthelemy has adopted does not cause any repugnance; the action is constant, and the only inconvenience is the well-known inflammability of the turpentine.

Besides these inhalations, chlorate of potassa was given internally, and almost always some quinine when the state of the temperature required it.

17 cases were subjected to this treatment with the following result: 6 proved fatal, but of these 2 were moribund on admission, and the others were in bad condition when seized with diphtheria. All of the cases of primary origin, free from complications at the onset of the disease, were cured. In 6 of the 11 successful cases, the larynx was invaded by the exudation, and in 3 of these the danger of suffocation was so imminent as to require tracheotomy.

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#### ON THE THERAPEUTIC VALUE OF CANELLA IN METRORRHAGIA AND MENORRHAGIA.

According to DR. J. CHÉRON (*Revue de Thérapeutique*, October 15, 1885), the physiological effects of canella are the following:

Two grammes (about 3ss) of the tincture cause a feeling of well-being, a sense of warmth at the epigastrium, accompanied by a transient but agreeable general excitation. The pulse becomes fuller, but is not increased in frequency. Ingestion of a larger dose—of two to ten grammes (3ss–3iij)—causes a more vivid sensation of heat at the epigastrium, and in the succeeding hour a very distinct general excitation, with some nervous agitation, rise of temperature, full pulse, scanty urine, and sweating of a critical character which terminates the systemic disturbance.

Canella is especially indicated in the menorrhagia and metrorrhagia of the chlorotic, and of the pregnant state in debilitated and lymphatic women, in the long-continued slight metrorrhagia which may succeed to delivery, and in the symptomatic metrorrhagia of cancer, of long duration and resisting other treatment.

Dr. Chéron recommends the powder of canella, with iron, in the metrorrhagia of chlorosis. It may be useful in this connection to note, that formerly canella with aloes—*pulvis aloes cum canella* (*hieria picra*, vulgo, *hickry pickry*)—had considerable repute as a remedy for amenorrhœa.

The composition of canella is especially interesting in view of its alleged utility in the affections above mentioned. It contains a bitter principle, *canellin*, and one per cent. of a volatile oil, which is made up of several oils, one of them identical with eugenic acid, present in oil of cloves.

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#### SANTONIN IN AMENORRHŒA AND DYSMENORRHŒA.

DR. J. CHÉRON proposes the use of santonin in the treatment of amenorrhœa and dysmenorrhœa (*Revue de Thérapeutique*, Nov. 1, 1885). He prefaces his observations on this therapeutic application of the remedy with an account of its physiological actions.

Santonin is but slightly soluble in water, but dissolves in alcohol in the proportion of 1 to 40. It is a vascular medicament, and it acts on the organic muscular fibre in the same manner as ergot. It perverts vision, and the senses of taste and odor. Objects seen have a yellowish or violet color, and the urine, which is increased in amount, has a yellow tint when acid, red when alkaline.

Santonin acts as a tonic to the stomach, and increases the appetite and the power of digestion. As is well known, it is a vermifuge, and expels the *ascarides lumbricoides* with certainty.

Dr. Chéron has obtained excellent results from its use in amenorrhœa and



dysmenorrhœa, more especially in cases characterized by anæmia, chlorosis, and general depression of the vital forces, about the period of puberty, when the menstrual function is tardily and imperfectly established.

He advises the following :

Santonin, ʒss. Make 40 pills by the aid of gum-tragacanth and glycerine. Two of these are to be taken before each meal. Also,

Santonin	.	.	.	.	.	.	.	4 grains.
Alcohol	.	.	.	.	.	.	.	ʒss.
Gum julep	.	.	.	.	.	.	.	ʒij.

A tablespoonful contains about one grain, and two may be taken before each meal.

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#### FOR WHOOPING-COUGH.

The following, applied to the orifice of the glottis in the form of spray, is said to cure whooping-cough very quickly :

Concentrated infusion of coca	.	.	.	.	f ʒiij.
Resorcin, chemically pure	.	.	.	.	ʒss.—M.

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#### FOR FETID SWEAT OF THE FEET.

Fennel water, distilled	.	.	.	.	Oij.
Hydrate of chloral	.	.	.	.	gr. lxxv.
Borax	.	.	.	.	gr. xxx.—M.

Wash the feet with the above morning and evening.

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## SURGERY.

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### EUROPE.

#### UNDER THE CHARGE OF

FREDERICK TREVES, F.R.C.S.,

SURGEON TO, AND LECTURER ON ANATOMY AT, THE LONDON HOSPITAL.

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### RECENT SURGICAL LITERATURE.

Certain notable additions have been made to surgical literature during the last few months. In the foremost place must be mentioned two works on surgical anatomy, which will prove of the highest value to the practical surgeon : *Die Chirurgische Anatomie in ihrer beziehung zur chirurgischen Diagnostic, Pathologie und Therapie*, by PROF. MAX SCHÜLLER; and *Handbuch der Topographischen Anatomie*, by PROF. FR. MERKEL. These books are being issued in parts, and the first part of each has as yet only appeared. The first instalment of Schüller's work is occupied with the upper limbs. The matter is original and well arranged. The topographical anatomy of the various parts

is dealt with only in so far as it illustrates questions of diagnosis, pathology, and treatment. The surface anatomy is very elaborately described, and the anatomy of the principal injuries and operations is admirably worked out. The fasciæ also are well described, and their influence upon the course of suppuration demonstrated by means of subfascial injections. Judging from the first part, this is the best and most complete work on surgical anatomy that has appeared in Europe.

The published part of Dr. Merkel's handbook deals only with the head, and is concerned almost solely with topographical anatomy. It contains much original matter, and the general treatment of the subject is also new. The chapters on the brain are perhaps the most valuable, and the work is illustrated by some very excellent woodcuts. At the present moment, when cerebral surgery is attracting attention, this elaborate account of the topography of the cranium is most opportune.

*Diagnostic et Traitement des Tumeurs de l'Abdomen et du Bassin*, by DR. J. PÉAN, Paris. This is an immense work of 1316 closely printed pages. It deals with tumors and inflammatory affections of the pelvic bones and articulations, with growths of the anterior abdominal wall, and with affections of the pelvic arteries, glands, and nerves. It embraces, also, all the disorders of the male genital organs, of the urethra, and bladder, and includes the subject of stone. It deals with affections of the vulva and vagina and with uterine tumors. The work is disappointing, verbose, diffuse, and very unequal. The chapters upon the male organs are poor and behind the time, and especially feeble is the chapter upon the bladder and stone. On the other hand, the account of the diseases of the vulva is valuable and exhaustive. Much pains have evidently been expended upon this part of the work, and the subject is illustrated by some admirable woodcuts. The chapters devoted to this matter are by far the best in the book.

The current number of BILLROTH and LUECKE's *Deutsche Chirurgie* will not be of much interest to surgeons. It is written by Dr. Heinrich Fritsch, and deals solely with uterine disease. The subjects included in the present number are the following: Distortion and displacements of the uterus, including prolapse, acute and chronic metritis, and endometritis. The work is profusely illustrated by a number of excellent diagrams.

The current number of FOLLIN and DUPLAY's *Traité Élémentaire de Pathologie Externe* continues the account of the diseases of the male organs. The parts dealt with are the tunica vaginalis, including the whole subject of hydrocele, the testicle, and the vesiculæ seminales. The diseases of the penis are just commenced. The work maintains its very high position as one of the most important standard works on surgery. The chapters on hydrocele are very complete. In the account of tumors of the testis, it is to be regretted that the term syphilitic sarcocoele is still retained. One of the most valuable chapters in this section is that dealing with cystic disease, while one of the least complete is that concerned with enchondroma of the testis.

The last contribution to the surgical section of VOLKMANN's *Sammlung* is written by DR. SCHUCHARDT, and concerns "*The Origin of Carcinoma from*

*Chronic Inflammatory Conditions of the Mucous Membrane and Skin.*" The work is essentially pathological, and is one of considerable interest and importance. The author deals first with buccal and lingual psoriasis, and describes the stages of passage between this affection and carcinoma. The clinical details of this transformation are familiar, but the histological data are here for the first time, so far as we know, fully demonstrated. He then deals in the same manner with epithelioma in its relation to chronic inflammation of the skin. This leads naturally to a consideration of chimney sweeps' cancer, tar cancer (tar molluscum), and paraffine cancer. He gives details of several cases of paraffine cancer—an epithelioma that is apt to attack those engaged in paraffine factories. In all, the scrotum was involved; and in one, the skin over the right elbow. The author concludes by an account of the relation of cancer to seborrhœa (seborrhagische Hautcarcinome), and gives a description of the microscopical aspects of the parts involved in seborrhœa senilis.

*De la Gastrostomie*, by DR. MARCEL COHEN, is a little work that will be of use in presenting the present position of this operation in clear terms. The book contains nothing original, but it is a valuable compilation. It gives a good bibliographical index, and statistical details of fifty-three cases. The author, as the result of his investigations, advises the incision of Albert, the immediate opening of the stomach, and feeding directly after the operation.

DRS. ESMARCH and KULENKAMPFF have published in a large volume (*Die Elephantiasischen Formen*) an elaborate account of elephantiasis and conditions allied to it. The work cannot be said to present much that is new, but it forms by far the most complete compendium of these diseases that has yet appeared. Its chief value consists in the very excellent clinical illustrations that are provided, and in the numerous portraits of patients that are added at the end of the work. It forms, indeed, a clinical atlas of elephantiasis and its allies. The authors enter into the history of the disease and the bibliography, which is, by the by, somewhat voluminous. They deal with elephantiasis proper, with nævoid elephantiasis, with certain congenital tumors, with pachydermatocele, with congenital papilloma and molluscum fibrosum. Of all these conditions excellent illustrations are provided, and too high praise cannot be bestowed upon the chromo-lithographs that find a place among these illustrations.

Of English books published during the last few months, attention may be directed to *Diseases of the Tongue*, by MR. H. T. BUTLIN, and to the first part of a work on *Operative Surgery*, by SIR WILLIAM MACCORMAC.

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#### THE ETIOLOGY OF ACUTE SUPPURATIVE INFLAMMATION.

In a case of acute osteomyelitis in the human subject, DR. GARRÉ (*Fortschritte der Medicin*, 1885, p. 105) found both the white and the yellow staphylococcus, but no other microorganisms—no streptococci. In a rapidly fatal case, moreover, he discovered the staphylococcus in the blood. As it has not been found by other observers in the blood, he imagines that it may vanish with varying degrees of fever. In some thirty cases of acute suppuration—boil, abscess, etc.—he found cocci which could not be distinguished

either by culture or in dried preparations from those of osteomyelitis. He, therefore, maintains that acute osteomyelitis possesses no specific features, and has associated with it an organism common to it and a large number of other acute suppurative affections.

He inoculated himself with the staphylococcus obtained by cultivation from a fatal case of osteomyelitis. He used a needle, and introduced the matter near the matrix of the nail. In one instance a little inflammatory swelling followed, which soon disappeared. In the second instance a large pustule followed, from the contents of which he obtained the staphylococcus. A third experiment was most important. He rubbed upon his forearm a solution containing staphylococci, derived from the fatal case of osteomyelitis. In six hours the spot so rubbed began to burn, and then at the bases of several of the hairs pustules appeared. In four days these pustules had coalesced, and had formed a somewhat serious boil. From the pus of the boil, cultivations of the yellow staphylococcus were obtained, unmixed with any other bacterium.

He concludes that both boil and carbuncle must be regarded as infectious diseases; that they are due to the same bacterium that produces osteomyelitis; and that the infection may be introduced through the excretory ducts of the skin without wound, as his third experiment upon himself appeared to demonstrate.

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#### TETANUS HYDROPHOBICUS.

A form of tetanus has been described under the above name, and it would appear that already some sixteen examples of the affection have been placed on record. A full account of this peculiar convulsive affection has been given by Bernhard, in the seventh volume of *Zeitschrift für klinische Medicin*. One great feature of these cases is a convulsion of the muscles concerned in swallowing, hence the name of "Kopftetanus" that is used by some. DR. HADLICH reports a case under this title which, however, differs from the typical form of the disease by the circumstance that there were no pharyngeal convulsions.

A boy aged two and a half years, received a slight injury on the right cheek. In twelve days paralysis of the right facial nerve appeared. Three days later trismus set in. Eight days after the onset of the facial palsy distinct tetanic convulsions set in. These convulsions appeared in the paralyzed part of the face, and there was a persistent partial contraction of the orbicularis oris, the orbicularis palpebrarum, and the levator alæ nasi.

The tetanic convulsions increased up to a certain point, then lessened and disappeared.

The dragging of the face to one side was noticed for six or seven weeks, when it disappeared. The general health was not conspicuously disturbed and the child made a perfect recovery.

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#### THE STATE OF THE URINE IN CERTAIN SURGICAL AFFECTIONS.

In *Annales des mal. des org. génito-urinaires*, No. 5, 1885, are several articles that bear upon this matter. Dr. Thiriard deals with the state of the urine after abdominal operations. He states that when the amount of the chlorides



in the urine falls below  $15\frac{1}{2}$  grains a day, after laparotomy, septic peritonitis threatens. He gives the normal amount as 186 grains per diem, which is below that usually stated. So long as the amount of the chlorides remains above  $15\frac{1}{2}$  grains, there need be no great cause for uneasiness, even if certain unfavorable symptoms should exist at the time. Thiriar also asserts that in malignant tumors of the abdomen the total amount of the solids of the urine is reduced to nearly one-third of the proper quantity. So marked is this, that he goes so far as to say that malignant and simple stenoses of the pylorus can be differentiated by this test.

Dr. Verchère draws attention to the fact that in cases of delayed union of bones after fracture, there is usually a greatly increased excretion of phosphates. This fact has already been allowed in connection with certain cases of non-union, but the author goes a step further, and declares that this peculiar urine is merely a symptom of a new disease or diathesis, to which the name of phosphatic diabetes is given.

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#### THE LOCALIZATION OF DERMOID CYSTS.

DR. TRZEBICKY (*Wiener med. Wochenschrift*, 1885, No. 13) discusses this matter especially with reference to three such cysts noticed in unusual sites. One of these was discovered at the back of the head, and the other two were found in the buttock. One of the latter was close to the rectum, and led into the pelvis by a narrow stalk.

It may not be unreasonable to suggest that the first named dermoid cyst may have represented the remains of a meningocele, and, with regard to the tumors about the buttock, they suggest some connection with those congenital sacrococcygeal tumors which so often contain dermoid matters. Such tumors have presented at the outlet of the pelvis, and have been found on dissection to be connected by a pedicle with the sacrococcygeal spine.

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#### GUNSHOT WOUNDS.

B. V. BECK, in a recent work (*Ueber die Wirkung moderner Gewehrprojektilen*), has entered into most elaborate considerations as to the effects upon the body of certain modern gun projectiles. The subject is illustrated by experiments upon animals. The work deals mainly with the physics of the matter, and will be of little use in the advance of military surgery. It affords evidence of very considerable labor, which will, however, be of more benefit to the gun-maker than the surgeon. A good abstract of the book appears in the *Centralblatt für Chirurgie* for July 25, 1885.

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#### A MODIFICATION OF THE CONTINUOUS SUTURE.

DR. ZESAS (*Centralblatt f. Chirurgie*, September 26, 1885) has introduced an excellent modification of the continuous suture. He uses a straight three-edged needle, and, as a suture material, sublimate silk. He begins at one end of the wound by a button suture (*a*), and then applies a quilt suture (*Matratzennaht*) along the whole length of the incision, as shown in Fig. 1. The wound edges are now drawn together, and the thread carried back to the point (*a*) by means of the ordinary continuous suture, as shown in Fig. 2.

By this suture more than the mere edges of the wound are brought together, and bagging of inflammatory material is almost entirely prevented. Dr. Zesas

FIG. 1.

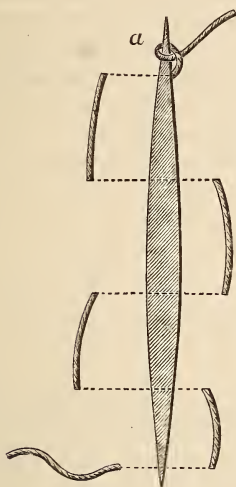


FIG. 2.



has used this suture in a large series of wounds, and speaks in very high praise of it.

#### CONGENITAL FRACTURE AND DISLOCATION OF THE ATLAS.

DR. WM. ALLEN (*Lancet*, October 24, 1885, p. 751) furnishes the most complete account of this somewhat rare condition with which we are acquainted.

The condition has been described by Guérin, who considered it to be probably due to a sliding of the condyles forward with elongation of the anterior ligaments. In the infant the subject of Guérin's remarks, there was such extreme extension of the head that "the head was exactly applied against the posterior part of the neck and upper part of the back." In two specimens of infants examined by Dr. Allen, there was a similar exaggerated degree of extension. Dr. Allen discusses in great detail the anatomy and etiology of the deformity, and brings his paper to an end by the following summary: 1. The injury may be expected to be present if an exaggerated degree of extension of the head is permitted, and more especially if forcible extension of the head or pressure on it from above induces a species of epileptic fit. 2. Probably the fits are due to pressure on the cord at the level of the fracture of the head and spine. At any rate, examination of dissected specimens shows that when the condition of parts permits the head to be bent backward on the spine more than is usual, the osseous and ligamentous structures cause a "dimpling in" of the meninges behind, sufficient to produce considerable narrowing of the canal at this level. 3. Anatomical defect of the atlas, or slenderness of the posterior arch, predisposes to the injury. 4. The fracture-dislocation is

produced by the posteriorly diverging occipital condyles being driven wedge-like between the atlantal lateral masses. This wedge-like action of the combined condyles stretches out the long axis of the oval ring of the atlas, and tends to produce rupture between its lateral halves; but the transverse ligament keeps the strain off the anterior arch, so that only the posterior arch gives way (constituting the fracture), and then the wedge-like action of the condyles, continuing, forces the back ends of the lateral masses outward from between the occiput and axis. Thus the production of dislocation closely follows the fracturing of the arch. 5. At birth the injury is most liable to be produced. Uterine contraction acting during parturition on an extended head (as in face presentations), presents mechanical arrangements from which such a result is highly probable.

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#### SPONTANEOUS DISLOCATION OF THE HIP.

PROF. ROSER (*Centralblatt für Chirurgie*, August 15, 1885) claims to have demonstrated a new cause for spontaneous luxation at the hip-joint. He has observed three cases in which the femur became spontaneously dislocated in patients suffering from Pott's disease.

It is well known that when the cord becomes affected in this disease, that complication may be attended by tonic and clonic muscular spasms. It is to these muscular movements—especially to such as take the form of abiding contractions—that the luxation is considered to be due. The dislocation is backward, and is of slow and painless formation. There is no swelling of the joint, no signs of hip-disease, and none of the wearing away of bone that is a feature of Charcot's disease.

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#### TRACHEOTOMY.

DR. BIRNBAUM (*Archiv für klin. Chirurgie*, Bd. 31, Heft 2) contributes a statistical paper upon the results of this operation. The paper deals with 140 cases, and covers a period of ten years. As regards the indications given for the operation and the details of the procedure, there is nothing new. A tube is recommended which is practically identical with one introduced by Bose. Steam inhalation forms an important feature in the after-treatment.

Tables are given to show the influence of age, sex, and season upon the operation, but they do not adduce any facts of practical interest. Of the 140 children, 93 died, a mortality of 60.4 per cent. In only 2 cases was there serious bleeding, and in 1 of these death followed. In 7 patients scarlet fever appeared shortly after the operation.

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#### THE TREATMENT OF PURULENT PERICARDITIS BY INCISION.

A case of pericarditis treated by incision is reported by DR. MICHAÏLOFF (*Medizinskoje Obosrenje*, 1885, No. 5). It unfortunately ended fatally. The instances in which this treatment has been adopted are still few, and as the operation is entirely upon the lines of the most recent advances in surgery, and as it has been most successful in some cases, the present report is worthy of notice. The patient was a female, aged thirty-five. In addition to the pericarditis she was suffering from enlarged liver, anasarca, and albuminuria,

and was cyanosed. A puncture into the pericardium was made in the fourth intercostal space and  $2\frac{3}{4}$  ounces of pus evacuated. The relief afforded was temporary. On the second day the pericardium was incised. The incision was four-fifths of an inch long, and was made in the fourth intercostal space close to the sternum. Two pounds of bloody pus escaped. The pericardial cavity was washed out with resorcine and well drained. The patient was at first relieved, but died collapsed in eighteen hours. The autopsy revealed a fatty and dilated heart and right hydrothorax.

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#### PRIMARY CHANCRES OF THE PALATE.

DR. BUROW (*Monatsschrift für Ohrenheilkunde*, Bd. 19) reports no less than six cases in which primary syphilis was communicated to patients by means of an infected Eustachian catheter. The sore in each instance appeared upon the palate or pharynx.

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#### CARTILAGINOUS TUMORS OF THE UPPER JAW.

M. PAUL BERGER (*Bull. de la Soc. de Chir.*, Paris, 1885), after giving an account of a case of resection of the upper jaw for chondroma, proceeds to analyze the reported cases of this form of tumors.

He finds 31 cases on record of removal of the superior maxilla for so-called "cartilaginous" growths. Of this number 7 are so imperfectly reported as to be of no value. Of the remaining 24, 19 were described as pure chondromata, 2 as osteoid chondromata, and 3 as chondro-sarcomata.

Of the first named series of 19, 5 were fibro-cartilaginous, 6 were in process of ossification, and 8 were composed of pure hyaline cartilage. This variety of tumor is of slow growth—the duration of the neoplasm varying from one to thirty-six years—and may attain great size. It shows no disposition to recur after complete removal.

The remaining 5 cases appear to have been examples of chondifying sarcoma, with some calcification in two instances (osteoid growths). These were of rapid growth—the duration varying between four months and two years—and showed a disposition to recur after removal.

Speaking generally, the author states that the most common point of origin of chondromata in this region is from the alveolar process, but the neoplasm may grow from any part of the bone. In three instances the tumors commenced in the ethmoid bone and invaded the jaw subsequently.

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#### NERVE SUTURING.

DR. RAWA (*Wiener med. Wochens.*, 1885, No. 11) finds fault with the present means adopted for bringing together divided nerves. He points out that when the divided nerve is at the same time crushed, so much of the nerve tissue may have to be cut away that a close approximation of the divided ends is not possible. He is of opinion, also, that the sutures introduced into the nerve substance act injuriously.

He, therefore, proposes the following operation, the details of which he has carried out upon animals: After the nerve ends have been laid bare, a loop of cutgut is placed around either end at a distance of about  $\frac{2}{3}$  of an inch from



the cut extremity. These loops include also the connective tissue around the nerve, and they are only drawn sufficiently tight to prevent them from slipping.

The ends of the catgut loops are then tied together, and the nerve ends so approximated. He states that the results obtained in animals by this procedure were invariably good.

It is to be noticed, however, that perfect restoration was only obtained at the end of several months. There is little to commend this operation. If it appeared—in a recent case of wound—that the nerve ends were so damaged that so large a quantity would have to be cut away as to prevent the approximation of these ends, one would imagine that the attempt at suture would be deferred until the extent of the damage has been ascertained. One would expect, also, that a tight ligature around a damaged nerve would increase rather than diminish its prospects of restoration. It is, however, very doubtful whether sutures applied in the long axis of a nerve in reality do more harm than a ligature secured firmly about it.

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#### THE TROPHIC DISTURBANCES IN TABES DORSALIS.

DR. HOFFMAN (*Berliner med. Wochen.*, 1885, No. 12) is disposed to recognize other peripheral changes than Charcot's joint disease, perforating ulcer of the foot, etc., as occasional phenomena of locomotor ataxia.

His paper is of much surgical interest, but his data are scanty, and his conclusions are open to some question. His chief points are the following:

1. Spontaneous rupture of the tendo Achillis may occur in tabes. He cites the case of a tabetic man, who suffered rupture of this tendon while turning round in the street. The patient had been the subject of syphilis, and there is no evidence to show that the rupture was not independent of the cord affection, and that it was not due to syphilitic disease in the tendon itself.

2. The teeth may fall out in the subjects of tabes. The case is quoted of a man whose teeth came out without pain and without his having been troubled with caries or toothache. They were lost upon both sides, and a wasting of the alveolus followed. The patient also had been a subject of syphilis.

3. The arthritic lesion may appear suddenly in the subjects of tabes. The patient whose case illustrates this proposition, was turning over in bed when he experienced a loud crack in his hip, and was suddenly attacked with pain in the part. Much swelling followed, with great lameness and with shortening of the limb. The patient had had syphilis. It must be confessed that this case presents all the features of a fracture of the neck of the femur, and it is well known that in certain subjects this accident has happened in the identical manner described.

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#### ODORLESS IODOFORM.

DR. OPPLER (*Centralblatt für Chirurgie*, July 25, 1885) claims to have introduced an odorless iodoform. The smell of iodoform offers a serious objection to its more general use in practice, and the attempts that have up to the present time been made to render the drug odorless have been but partially successful. In the mixtures of iodoform with Tonquin bean, balsam of Tolu, oil of peppermint, etc., the peculiar smell of the drug is still to be observed.

Dr. Oppler mixes the iodoform with finely powdered coffee, and maintains that by this admixture the odor of the iodoform is entirely lost. The powder is composed of one part of coffee to two parts of iodoform. The coffee should be fresh roasted, and must be very finely pulverized in a mortar. By the use of coffee powder, also, the ointment of iodoform can be rendered free from smell. Dr. Oppler maintains that coffee as a local application acts as a mild antiseptic. We have tried this mixture and find that the smell of the drug is entirely lost as Dr. Oppler claims.

#### A NEW INJURY.

M. BOUILLY (*Ann. Méd.-Chir.*, 1885, No. 2) claims to have discovered a new surgical lesion, a sprain of the superior tibio-fibular joint. He has met with one example of it. A man, aged sixty, slipped on the street, but saved himself from falling by a sudden and vigorous bending of the body backward. He at once experienced violent pain in the region of the knees, which pain increased rather than abated during the next few days. On the outer side of the right knee, in the situation of the superior tibio-fibular joint, was an ecchymosis, and about this point there were some swelling and considerable tenderness on pressure. The knee-joint itself appeared to be perfectly sound. Similar phenomena were to be noticed—but in a slighter degree—upon the left side. Conclusions founded upon the experience of a solitary case are apt to be misleading, and it must be confessed that the symptoms present in M. Bouilly's patient are susceptible of more than one explanation.

#### THE RESULTS OF OSTEOTOMY.

DR. HOFMOKL (*Archiv für Kinderheilkunde*, 1885, Bd. vi.) gives the details of 52 operations upon deformed bones in 26 individuals. The operations are thus divided: osteoclasty 10; linear osteotomy 31, and osteoectomy 11. 10 of the patients were males and 16 were females. Their ages ranged between 2 and 23 years. In 18 cases in children (between 2 and 8 years) the operations were undertaken for rachitic deformities, and in 8 cases in adults for genu valgum or varum.

Of the 10 osteoclasties, 3 failed on account of the firmness of the bone, and the remaining 7 did well. Of the other 42 operations, 21 were linear osteotomies of the bones of the leg, and 11 were examples of Macewen's osteotomy of the femur; 11 were osteoectomies. Of this number 31 healed by first intention, 10 by second intention, and 1 died of pyæmia. Dr. Hofmokl considers that the chief obstacle to healing by first intention is bleeding from the bones, and to prevent this he fixes the limb for 8 or 10 days in a very elevated position; and in children he adopts vertical suspension of the limb. He advises that in young patients some supporting apparatus should be worn for a considerable period after the healing of the wound. He divides the treatment of genu valgum and varum into three categories according to the severity of the case. (1) The use of apparatus and elastic accumulators. (2) *Redressement forcé* with or without tenotomy. (3) Osteotomy. He is entirely in favor of Macewen's operation. He advises the use of a supporting apparatus for some three months after the operation. He points out

that the callus produced when suppuration had occurred was stronger and firmer than that met with when the parts healed by first intention.

MR. WILLETT (*St. Barth. Hosp. Reports*, vol. xx. p. 59) gives an account of 101 osteotomies. The results were exceedingly satisfactory. Mr. Willett prefers Macewen's operation to Ogsten's in the treatment of genu valgum and varum, and, indeed, this list includes only 3 examples of the latter operation. Ten operations were performed for the relief of ankylosis at the hip-joint. In six instances the neck of the femur was divided by Adam's method. For this operation Mr. Willett uses the saw in preference to the chisel. In the remaining 4 cases the femur was divided below the trochanters. One death followed, and in the remaining cases an excellent result ensued.

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#### THE TREATMENT OF TUMORS OF THE BLADDER.

A discussion upon this subject was opened at the British Medical Association Meeting at Cardiff, by MR. REGINALD HARRISON (*British Medical Journal*, August 15, 1885). Mr. Harrison's paper presented an epitome of his well-known views upon the subject, and discussed the operations with which his name is so honorably connected. The discussion that followed the paper did not elicit any matters of importance. Mr. Harrison divides vesical growths into two classes. (1) Those which, during their entire existence, or for a portion of it, occasion either slight or no distinct indications of their presence, and (2) those which declare themselves by symptoms either seriously disturbing the function of micturition, or which, by their constancy or degree, threaten the life of the patient. It is to the latter class of growth alone that treatment is directed. The mere subjective evidence that a person has a tumor in the bladder, will not warrant the adoption of any operative measures to effect its removal. Mr. Harrison concerns himself solely with non-malignant growths, and does not enter into the question of excision of portions of the vesical wall. He advocates digital exploration when it can fulfil at least three objects: (1) the relief of symptoms which are otherwise irremediable; (2) verifying the diagnosis of tumor; (3) determining whether the removal of the growth can be proceeded with. As Mr. Harrison points out, even in cases of epithelioma, the incision required to allow a digital examination affords often great relief by draining the bladder, and relieving the patient of the cystitis produced by decomposing urine. He strongly advises, both for exploratory and operative purposes, median perineal urethrotomy in preference to the suprapubic operation. Mr. Harrison has introduced a very ingenious pair of forceps for the removal of growths when the interior of the bladder has been opened up. The details of the operation remain the same.

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#### LITHOLAPAXY WITH COCAINE.

An interesting case of this operation is reported by PROF. BRUNS, in *Berliner med. Wochenschr.*, 1885, No. 21. A two per cent. solution of cocaine was introduced into the bladder and also into the urethra. The calculus proved to be composed of oxalate of lime, and was exceedingly hard. Thirty-three separate crushings were executed in twenty-two minutes, without any pain having been felt. The patient began to complain of pain thirty minutes after

the commencement of the operation, as the fragments were being washed away. The pain, however, was quite slight. After the operation a ten per cent. emulsion of glycerine and iodoform was injected. The litholapaxy was followed by complete success.

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#### ENLARGED PROSTATE TREATED BY ELECTROLYSIS.

At the commencement of the present year PROF. BOTTINI published an account of a case in which the symptoms produced by enlarged prostate were removed by destroying some part of the prostate by the galvanic cautery. The operation practically consisted in burning out a new prostatic urethra, An abstract of Bottini's paper appears in this Journal for July, 1885.

Recently DR. CÆSAR MUSATI has published another example of this operation (*Centralb. für Chirurgie*, July 11, 1885). The great interest of the case consists in the fact that the operation was performed upon Dr. Musati himself by Prof. Bottini. Dr. Musati had been for some time troubled by the usual symptoms that attend enlarged prostate, and the operation gave him complete relief. No anæsthetic was employed, and Dr. Musati states that the pain felt at the time of the operation was by no means severe.

Time alone can demonstrate the real value of this procedure, which, however, appears to be simple and safe.

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#### MUTILOCLULAR HYDROCELE.

DR. STEINTHAL (*Centralblatt für Chirurgie*, Oct. 10, 1885) describes two examples of this rare affection. The first case was that of a man, aged twenty-two, who, when fourteen years old, received a wound of the scrotum. A hydrocele followed, which had been tapped many times. It was finally treated by the radical operation (incision of the sac). When the main sac was opened there was seen at the bottom of it a mass composed of a multitude of cysts; the largest of these were the size of a cherrystone. They contained a clear white fluid. The mass was removed; the testis was untouched and appeared to be perfectly normal; a permanent cure followed. The second case was that of man aged twenty. The radical operation was performed, and the local condition was in all essential points identical with that just named. This form of hydrocele has been often described, but previous to Dr. Steintal's paper no account appears to have been furnished of the microscopic appearances. On microscopic examination the minute cysts were found to be lined with a layer of fine endothelium, and were embedded in a vascular connective tissue rich in cells. From one of the cysts cords were noticed to be running, which were made up of endothelial cells; another space contained a lymph thrombus. From these appearances Dr. Steintal concludes that the cysts have developed from dilated lymph vessels, and he gives to the condition the name of cystoid lymphangioma.

He is disposed to think that the disease is acquired and not congenital, and that it may be induced in the first instance by some inflammatory process.

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#### SPLENECTOMY.

It is sincerely to be regretted that some surgeons, in spite of the very clear experience of the past, continue to excise spleens in cases of leucæmia. The



operation has been performed often enough to satisfy the most sceptical, and in no single instance has the patient recovered. The last addition to this terrible series of deaths has been made by Rydygier. An account of the case is published by DR. BIZIEL, in *Przegląd lekarski*, 1885, No. 14. The patient was a woman aged thirty-one. Splenic enlargement had been noticed for about three years. She had pronounced leucæmia. The operation was performed without difficulty, and the patient died in twenty-four hours.

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#### DIAPHRAGMATIC HERNIA.

An interesting case of this somewhat rare rupture is reported by Drs. GALASSI and TENERI, in *Lo Sperimentale*, 1885, No. 3. The patient was a woman, aged twenty-eight. She was seized with sudden abdominal pain, followed by vomiting and constipation. The examination of the thorax (which must have been very loosely conducted) revealed nothing. Both the right and the left side of the colon were found to be full. The symptoms of intestinal obstruction increased, and on the seventh day of the disease laparotomy was performed. There was no peritonitis. The result of the laparotomy was that the cause of the obstruction was not detected. The patient died on the following day. At the time of her death there appears to have been no suspicion that she suffered from diaphragmatic hernia. Such a rupture, however, was revealed at the autopsy; and was apparently of congenital origin. The transverse colon was found in the left pleural cavity, and had become occluded by kinking. It is to be regretted that the patient was not subjected to a more careful examination, and that the laparotomy had not been more systematically carried out. This is probably the first instance of laparotomy for diaphragmatic hernia.

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#### RESECTION OF INTESTINE FOR WOUND.

The operator was DR. KWIENCINSKI (*Przegląd lekarski*, 1885, No. 5). The patient, a man aged twenty, was stabbed in the abdomen. Through the wound a metre of small intestine protruded, in which four wounds were discovered. Two of these wounds were closed by suture, but the remaining two were so close together that suture was impossible. The involved segment was therefore resected. The divided ends were united by suture, the bowel returned, and the abdomen closed. The patient made a good recovery. This case makes another link in the chain of argument for the treatment of these cases by resection—a treatment that has been so admirably illustrated by the practice of Bull, of New York; Kocker, of Berne; Annandale, of Edinburgh, and others.

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#### SARCOMA OF THE BOWEL.

DR. BESSEL-HAGEN (Virchow's *Archiv*, Bd. xcix. Heft 1) reports the case of a boy aged seven, who, some little time after having received an injury to the abdomen, developed a tumor about the damaged spot. He rapidly became marasmic, and died in four months. The autopsy revealed a sarcomatous growth in the jejunum of the size of the fist. It was of the small round-celled variety, and sprang from the submucous tissue. There were

many secondary deposits. The case is of interest in connection with the supposed influence of the injury and the rapid progress of the disease, apart from the great rarity of these neoplasms in the bowel.

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### THE RADICAL CURE OF HERNIA.

MR. KEETLEY (*Brit. Med. Journal*, September 19, 1885) advocates a modified form of what is known as the injection treatment. The treatment of reducible ruptures by injecting some irritant fluid into the tissues about the hernial orifice was first introduced by Dr. Heaton in 1832, and subsequently advocated with obtrusive vigor by Dr. Warren. The measure never appears to have taken any hold of the surgical mind in this country. In Germany it has been adopted, and has received a considerable number of supporters. Last year Dr. Schwalbe published a treatise (*Die Radikale Heilung der Unterleibsbrüche*) advocating this measure. It appears from this paper that the treatment must extend over a period varying from two to twelve months, and that on an average twenty injections are required in each case.

Apart from the tedious character of the proceeding, these operations are attended with danger, in that the injection is made blindly, and no security is offered to insure the non-entrance of the fluid into the sac or into the peritoneum. Mr. Keetley's procedure removes the principal objections brought against the injection method. He does not make his injection blindly. He cuts down upon the inguinal ring, and thrusts a probe through the undivided inter-columnar fascia into the inguinal canal. Along the probe is introduced a canula, and through the canula the fluid is injected into the canal. Mr. Keetley uses a freshly prepared concentrated decoction of oak bark. After the injection, the pillars of the external ring are brought together by two catgut sutures. Mr. Keetley has operated upon eleven cases, and in two only has the result "fallen short of complete success." All these operations have been performed during the past twelve months, and it is obvious that sufficient time has not yet elapsed to allow of the value of the operation being judged. It is difficult, also, in these cases, to separate the effect of the injection from the effect of the closure of the external ring. In cases in which injection alone has been used, repeated injections have been required to effect a cure, and little has been done by one application.

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### THE MECHANICAL CLOSURE OF ARTIFICIAL ANUS.

DR. TELEKY (*Wiener med. Blätter*, 1885, No. 9) writes upon this subject. It must be allowed that the various pads, trusses, and receptacles that have been devised for the artificial anus after lumbar colotomy do not very efficiently fulfil their intentions. In actual practice the patient very commonly discards them all, and adopts some simple arrangement of his own. Dr. Teleky has added another apparatus to the list. It consists of two India-rubber balls, which are united by a short, thick, narrow and solid stem. One of the balls lies within the gut, and serves to close its lumen; the other, the larger, lies upon the wound, which it covers and protects. The stem occupies the sinus between the skin-wound and the gut lumen, and must, obviously, be very short. The balls are introduced empty and are inflated *in situ*. They

do not communicate, but are inflated separately. It is doubtful if this apparatus will answer much better than the previous ones, and the advisability of retaining a foreign body in the bowel may be open to question.

## AMERICA.

### UNDER THE CHARGE OF

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### A CASE OF ENUCLEATION, WITH REPLACEMENT OF THE HUMAN GLOBE BY THAT OF A RABBIT.

DR. H. W. BRADFORD, Asst. Surg. Mass. Eye and Ear Infirmary, records, in the *Boston Med. and Surg. Journal*, Sept. 17, 1885, a case of operation, done August 9th, upon a patient thirty-five years old, whose right eye had become very much atrophied in consequence of an injury received in early childhood.

The enucleation was done in the usual manner, but a suture was passed through the tendon of each rectus muscle, and one through the optic nerve, before its division.

The rabbit's eye was removed through a circular incision in the conjunctiva  $\frac{1}{2}$  of an inch from the corneal border, the tendons were cut close to the globe, and the nerve at about  $\frac{3}{10}$  of an inch from the sclerotic. Then the cavity of the patient's orbit was partly filled with albumen from a fresh egg, and the rabbit's eye was dipped in the same. The ends of the optic nerves were brought together by a suture secured by a slip-noose, the tendons of the recti sutured to the subconjunctival tissue in appropriate positions, and the conjunctivæ united to each other by four sutures. [Apparently the sutures were of silk.]

The lids having been dried, iodoform was dusted over them, and a pad of absorbent cotton and flannel bandage applied.

The dressings were undisturbed until the seventh day, when the cornea presented a slight haziness, and was covered by the chemosed conjunctiva, except on the outer side, where the suture of the external rectus had cut out and allowed the muscle to retract and draw the conjunctiva backward; the movement of the eye was good in all directions, except that divergence was imperfect. The sutures were withdrawn from the nerve and the upper and internal recti; instillation of atropine; reapplication of the dressing.

On the twelfth day the cornea was less hazy; the conjunctiva well united; the movements of the globe satisfactory.

The report ends on the eighteenth day. Conformation and tension good; cornea improving, and has cleared peripherally, so as to allow the iris to be distinctly seen; conjunctiva congested; ocular movements in all directions good.

It is suggested that the operation may be valuable not only for corrective effects, but also in young children, to prevent arrest of development of the orbit; and for this purpose Dr. Bradford proposes that the eye of a young dog should be taken, in the hope that it would continue to increase in size after transplantation.

It is unfortunate that the report ends so soon after the operation (the eighteenth day), for at the meeting of the Paris Académie de Médecine, May 26, 1885, Dr. Chibret reported a successful operation of the same kind, done on the 4th May, twenty-two days before, and yet subsequent reports inform us that the cornea finally sloughed.

In the *Bulletin de la Société de Chirurgie*, for Aug. 12, 1885, p. 592, mention is made of the receipt of the report of a case of the same kind by Rohmer, the eye of a dog being used. The cornea sloughed on the seventh day, and the globe became atrophied.

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#### INCISED WOUND OF ABDOMEN AND COLON; RECOVERY.

DR. T. W. COMPTON, in the *New Orleans Med. and Surg. Journal*, Nov. 1885, p. 363, records a striking example of recovery from a severe wound and prolonged exposure of the intestines, without the aid of any of the antiseptic measures to which so much importance is now so generally, and so rightly, attached. The patient, a negro, received a transverse razor-cut in the abdomen, two inches long, about two and a half inches from the umbilicus, through which twenty inches of the colon protruded. The gut was cut in half, transversely, with two small cuts on the opposite side made from within outward by the point of the razor. The patient remained five hours without treatment, the gut protruding and covered only with a soiled handkerchief. The incisions in the gut were closed with silk sutures, one end of that closing the large one being left long. It was then returned, after enlargement of the abdominal wound, the long incision in the gut being held against the abdominal incision by the end of the suture, which was brought out through the external wound and fastened to the skin by adhesive plaster. The abdominal wound was closed with three stitches, and covered with a dry compress. Recovery took place without incident, and was complete in five weeks. The first movement of the bowels was on the seventeenth day. The dry compress was removed by soaking on the fifth day, and another substituted. No suppuration of the external wound, except along the track of the end of the intestinal suture.

Two other cases of laparotomy and suture of the intestine in the treatment of gunshot wounds of the abdomen, have been recently reported.

In the first, under the care of DR. J. B. HAMILTON, of Washington, D. C., (*Journ. Am. Med. Assoc.*, Aug. 22, 1885) the patient was a mulatto, nineteen years old, and the bullet, of thirty-two calibre, entered the abdomen an inch above and to the right of the navel. The operation was done two hours after receipt of the injury. A six-inch incision was made in the median line, through which the intestine was drawn out and examined. Eleven wounds were found in the small intestine and two in the ascending colon, and closed with sutures. A wounded artery in the mesentery was tied, and a wounded portion of the omentum ligatured *en masse* and cut away. A large amount of blood found in the abdominal cavity was removed, the cavity sponged with a solution of bichloride of mercury, the intestine returned, and the external wound closed. On the thirteenth day great rectal tenesmus appeared, due to the presence of a tumor in the pelvis. This tumor was incised through the rectum two inches above the anus, and proved to be composed of thin, badly smelling blood, which escaped to the amount of about three



pints. The patient recovered, and apparently no fecal extravasation had taken place, although a melon seed was found in the peritoneal cavity.

In the second case, recorded by DR. D. A. V. PARK, in the *Chicago Med. Journ. and Examiner*, Nov. 1885, p. 412, the patient was a lad sixteen years old, and the bullet, twenty-two calibre, entered two inches to the left of the median line midway between the pubes and navel. The operation was done twenty-two hours after the receipt of the injury. An incision four inches long, parallel to the median line, was made through the wound. A large amount of decomposed blood, which promptly clotted on exposure to the air, was found within the abdominal cavity, a bleeding artery in the mesentery secured, and a half-inch wound in the small intestine closed by sutures. The operation was done with great attention to cleanliness, but not antiseptically, in the strict sense. No fecal extravasation recognized. The patient died about fifteen hours after the operation with commencing general peritonitis. The autopsy showed that the cavity had not been entirely cleaned of blood, and that another perforation of the intestine (p. 465), and a bruise of the rectum had been overlooked.

In still another case, in the practice of DR. E. ANDREWS (*Journ. Am. Med. Assoc.*, Aug. 15, 1885), an exploratory incision was made in the median line above the umbilicus for probable pistolshot wound of the stomach. No wound of stomach or intestines was found, and, after removal of a considerable quantity of bloody serum, the external incision was closed. The patient recovered. The wound was made by a thirty-eight calibre ball at the edge of cartilages of the ribs; above and to the left of the umbilicus. The ball passed entirely through the body, coming out at the back on the same side, and the point at which it entered the peritoneal cavity was recognized during the operation.

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#### CHOLECYSTOTOMY.

DR. A. C. BERNAY records in the *Weekly Medical Rev.*, Oct. 31, 1885, p. 350, the case of a woman aged forty-six years, in whom a tumor appeared as a lump in the median line above the navel, three years ago, but had grown only during the six months preceding the operation. It was as large as a goose egg, smooth, hard, and movable. An exploratory incision was made in the median line, beginning one inch below the ensiform cartilage, the tumor drawn out, punctured, and then incised. About one pint of clear mucus escaped, with twenty small gall-stones. A large stone was found impacted in the gut, and was removed after slitting the folds which partly covered it. The incision in the sac was closed with a double row of silk sutures, the sac returned, and the external wound closed. The patient vomited a large quantity of bile the night following the operation; recovery was complete by the twenty-first day.

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#### ASTRAGALOID OSTEOTOMY IN THE TREATMENT OF FLATFOOT.

MR. WILLIAM STOKES, F.R.C.S., in an article in the *Annals of Surgery*, Oct. 1885, contributes the anatomical description of the calcaneum and astragalus taken from the body of a person affected with flatfoot, and the

account of an operation successfully performed by himself in another case, and briefly discusses the etiology of the affection.

The specimen showed the head of the astragalus directed downward, its articular surface in contact with the inferior calcaneo-scaphoid ligament, and a new articular facet on its upper and now anterior surface for articulation with the somewhat hypertrophied scaphoid. The sustentaculum tali, instead of being horizontal, was directed downward and forward, the head of the astragalus was enlarged, and the upper surface of its neck was lengthened.

The patient upon whom he operated was a strongly built, healthy lad, fourteen years old, with well-marked flatfoot on one side, who complained greatly of pain in the foot, especially in the medio-tarsal joint, after walking or standing for even a short time.

The operation consisted in removal, with strict antiseptic precautions, of enough of the articular end of the head of the astragalus to allow the foot to be brought into a correct position. The wound healed without suppuration, the foot being kept adducted, and the result at the end of six months was excellent and promised to be permanent, the boy being then able to walk or run as well as any.

The author rejects the theories of ligamentous relaxation and muscular paralysis, and accepts that of primary osseous deformation.

Many desirable details are lacking in the history of the specimen and the case, but the operation may be readily accepted as a proper one when the malposition of the foot cannot otherwise be corrected. The changes in the bones of the specimen may, however, be fairly deemed the result rather than the cause of the deformity, although when they are present they may make operative treatment necessary.

Without entering into a discussion of the etiology, attention may be called to the usual sequence of symptoms in acquired flatfooted valgus. In the normal evolution of the shape and position of the foot after birth the original position of varus disappears, and pronation is more free than supination. This change is in the direction of valgus. Roberts has found valgus in one and a half per cent. of children at the age of eight years, and in thirteen and a half at the age of twelve. Painful valgus is practically limited to adolescents (Gosselin terms it *tarsalgie des adolescents*), and is by far the most common in those who have to stand or walk or carry heavy burdens. It is characterized in its early stage by pain at the medio-tarsal joint, appearing only after the patient has stood or walked for a long time, and promptly disappearing during rest. A chance post-mortem of one such case in the first stage (Gosselin, *Bull. de l'Académie de Médecine*, 1865, p. 144) showed the signs of an arthritis of the medio-tarsal joint. To this stage regularly succeed others in which the valgus becomes more marked, and finally permanent, with or without contraction of the anterior and peroneal muscles of the leg, and preservation of the arch of the foot. Softening and elongation of ligaments are common results of arthritis.

That the head of the astragalus should lengthen in the direction in which it is no longer opposed by the scaphoid, is in keeping with changes in other bones under similar circumstances, notably with the projection of the femoral condyles in subluxation of the tibia, and that altered lines of pressure should modify the shape of the calcaneum is also in keeping with other pathological data.

### REPRODUCTION OF TWO AND THREE-FOURTHS INCHES OF THE CLAVICLE BY GRAFTING WITH PERIOSTEUM AND BITS OF BONE TAKEN FROM DOGS.

DR. C. W. TRUEHEART, of Galveston, Texas, records in the *Med. Record* for Oct. 3, 1885, a case operated upon in 1876. The patient lost nearly four inches of the central portion of the left clavicle by a gunshot wound, and after recovery found himself much disabled by the lack of support of the shoulder. The cicatrix was cut out, leaving a wound three-quarters of an inch deep, one inch wide, and two and three-quarters inches long between the ends of the bone. After a bed of granulations had formed upon its surface, it was covered with periosteal and thin bony grafts the size of hemp-seed, taken from the limbs and shoulder-blades of dogs, and placed at intervals of about three-eighths of an inch, the shoulder being supported by an axillary pad. On the fifth day seven or eight out of every ten grafts were found to have "taken," and after they had been covered in by the spread of the adjoining granulations, a second series was applied. Three such graftings were done, and then, the wound having become filled, its cicatrization was hastened by skin grafting. Two months later the gap appeared to be completely filled out by a firm tissue of bony consistency, and measurement of the two clavicles showed shortening of only a quarter of an inch on the injured side. A recent examination of the patient shows no change except an angular deformity due to a fracture of the new-formed section caused by a fall a few months ago.

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### CONTRIBUTION TO THE ETIOLOGY OF MALIGNANT TUMORS.

DR. R. J. HALL, of New York, published in *The Medical News* for Oct. 31, 1885, p. 478, a thoughtful, well-constructed argument in favor of the theory that malignant tumors have their origin in a bacillary infection, and are, therefore, communicable from the patient to others. The argument consists of a criticism of the alternative theories, of the histories of eight cases of supposed communication, of various instances of experimental and of "contact" infection, and finally of the discovery of bacilli in a case of large-celled sarcoma. The analogy with tuberculosis, and especially the history of the germ theory of tuberculosis, are also quoted in support.

All these arguments are advanced with caution, and with an appreciation of their shortcomings, which speaks highly in favor of the spirit in which the author has treated the subject, and makes criticism unnecessary.

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## OPHTHALMOLOGY.

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UNDER THE CHARGE OF

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### CONTRIBUTIONS TO THE STUDY OF THE EMBRYOLOGY OF THE EYE.

DR. REAL Y BEGRO's investigations (*Recueil d'ophthal.*, August, 1885) were conducted mainly upon animals, and from them he deduces the following



conclusions: 1st. The vitreous body of the embryo is not formed by a mesodermic bud or shoot which penetrates into the cavity of the secondary ocular vesicle through the fetal fissure, but is formed by the chorio-capillaris which accompanies the distal wall of the primary ocular vesicle during its invagination. It is, therefore, formed by a vascular plexus which exudes gradually a hyaline substance which fills its meshes. 2d. The network of the posterior vascular membrane of the lens and the hyaloid artery are the last vestiges of the plexus of the vitreous. 3d. The capsulo-pupillary membrane is a dependence of the plexus of the embryonal vitreous body, and its development occurs *pari passu* with that of the lens. 4th. The retinal vessels do not arise from the plexus of the vitreous body, but from the central vessels at the level of the optic papilla. 5th. The zonula and the hyaloid membrane form a differentiation of the hyaline substance of the vitreous. 6th. The comb in the eye of birds is the homologue of the plexus of the vitreous body of mammals. 7th. In birds there is no pupillary membrane nor vascular capsule of the lens.

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#### EXTIRPATION OF THE ENTIRE LACHRYMAL GLAND.

BADAL (*Arch. d'ophthal.*, Sept.-Oct. 1885) draws the following conclusions from a consideration of this subject: 1st. The orbital portion of the lachrymal gland is perfectly isolated from the palpebral portion by its fibrous sheath, and its complete extirpation presents no serious difficulty or danger. 2d. It is very difficult to remove all the lobules of the accessory portion, distributed and almost lost in the thickness of the lid. 3d. The removal of the orbital portion has no effect upon the lubrication of the eye, but only abolishes the power to weep. 4th. It is possible that the function of this portion of the gland is solely to secrete tears. 5th. The accessory gland, in connection with the other glands of the lids, presides over the lubrication of the eye. Its permanent and regular secretion is but little or at all modified by those sources of irritation which excite the activity of the orbital gland. Hence, that part of the gland known as *accessory* would be the more important of the two; while the orbital portion would be considered as the *real lachrymal* gland, but of secondary importance. 6th. The excretory canals of the orbital and palpebral portions are more numerous than is generally thought by modern authors. 7th. It is certain that a portion at least of the canals coming from the orbital gland are not joined by the canals coming from the palpebral portion. 8th. The removal of the palpebral portion of the gland might be attempted in those cases in which the extirpation of the orbital gland had failed to relieve a painful lachrymation. 9th. The simplest method of operating on the palpebral portion of the gland consists in making an incision along the external third of the orbital arch, and prolonging it a short distance beyond the palpebral commissure. 10th. In cases of incurable ectropium with profuse lachrymation, the extirpation of the two portions of the gland might be made at once by this same incision.

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#### THE INJURIOUS EFFECT OF COCAINE UPON THE CORNEA.

BUNGE reports (*Kl. Mon. f. Aug.*, Sept. 1885) a number of cases in which cocaine, which had been employed previous to operation, produced infiltration



and loss of substance in the cornea. The first case was a cataractous patient, in whom a four per cent. solution of cocaine had been energetically employed as a preliminary to operating. When the operator was about to begin, it was found that the cornea had suffered a loss of epithelium at its centre over a space  $\frac{1}{8}$  of an inch in diameter, but had remained transparent. There were no signs of irritation in the eye. The operation was postponed, and the eye bandaged. In twenty-four hours the loss of epithelium had been repaired, and three days later the extraction was done without cocaine. A second case occurred in a woman, *æt.* 54. The same loss of epithelium occurred at the centre of the cornea after the energetic use of cocaine. The operation was postponed and the eye bandaged. In two days the cornea was again perfectly normal, and on the fourth day the operation of extraction was done without cocaine. Then come a series of seven cases in which cocaine was used as a preliminary to operation, in which there was no loss of epithelium before the operation, but in which, after the operation and antiseptic dressings, there occurred a parenchymatous infiltration of the cornea, and in one case a vesicular keratitis. The opacity seemed to start from the wound, and extended toward the lower margin of the cornea. The surface of the cornea seemed to be in places lifted up and in other places depressed.

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#### CASE OF CYST OF THE CILIARY BODY.

AUB reports (*Amer. Journ. of Ophth.*, May-June, 1885) an interesting case of this rare disease, resulting from an injury. The patient was a man, *æt.* 27, who was cut over the forehead and right eye, with two gashes through the lid, one extending into the lower. The wounds were united and the eye bandaged. Aub saw the patient for the first time four months later. At the inner side of the cornea, about 3''' from its margin, was a vertical scar 4''' long, which was much thinned and decidedly depressed. Anterior to this scar the eye was staphylomatous. The cornea was clear, the anterior chamber free, the pupil oval and drawn toward the scar. The outer pupillary margin of the iris was adherent to the capsule. The lens was clear, except for some pigment deposits on the posterior capsule. Just behind the lens, and springing from the ciliary region, was an oval body extending halfway across the vitreous. The cyst-walls were transparent.  $V. = \frac{9}{CC}$ . After dilatation of the pupil, the cyst was found to originate at the centre of the scar, behind the suspensory ligament. It pushed the lens forward. The cyst gradually extended across the eye, and vision was eventually reduced to counting fingers at nine feet.

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#### A CASE OF CHRONIC GLAUCOMA OF UNUSUALLY LONG DURATION.

PRIESTLEY SMITH records (*Ophth. Review*, September, 1885) a case in which the diagnosis of glaucoma was made nearly twenty years before operative treatment was undertaken. The patient was a lady, aged forty-five when first seen. An excess of tension was present at the beginning, and was well marked twenty years later, but was probably intermittent throughout. Very deep excavation of the disks coexisted with good sight, and only moderate contraction of the fields. Iridectomy gave an excellent result in each eye.

Throughout the long period of twenty years, there was probably an ever present tendency to increase of tension during periods of nervous exhaustion, and disturbance of the vasomotor system, to which the patient was peculiarly liable. The author thinks that the excavation of the disk in glaucoma is not a purely mechanical result of exalted pressure; it is, in part at least, an atrophic condition, which, though primarily due to pressure, includes vascular changes and impaired condition in the substance of the disk, which require a long time for their full development, and which may probably progress, even though all excess of pressure be removed.

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#### AFTER-TREATMENT OF CASES OF CATARACT EXTRACTION.

BERRY recommends (*Ophth. Review*, September, 1885) very careful anti-septic precautions. Before operation the conjunctival sac should be thoroughly washed out with a solution of corrosive sublimate (1:5000). The instruments should be cleaned in absolute alcohol, and then immediately afterward laid in a solution of carbolic acid (1:20); whence, before being used, they should be transferred to a saturated solution of boric acid. After frequently washing out the conjunctival sac, during and after the operation, with the sublimate solution, a piece of lint, dipped in the same solution, is applied over the closed lids, and on top of this a piece of gutta-percha tissue, and then a pad of cotton-wool, the whole being retained in position by means of a light flannel bandage. In cases where a chronic conjunctivitis or epiphora exists, a thick layer of finely powdered iodoform is applied directly to the wound in the eye before putting on the dressing. The dressing is changed after twenty-four hours, the eye examined, carefully bathed with the sublimate solution, and again dressed in the same way. If a good anterior chamber is found, the wet antiseptic dressing, which is renewed every twenty-four hours, is exchanged on the fourth day for a dry antiseptic one, which merely consists in a pad of fine absorbent cotton-wool, dipped in the sublimate solution, and allowed to dry on the eye. On the sixth or eighth day the bandage may be changed to a shade. Berry uses mydriatics only when there is a trace of iritis, and myotics only in the rare cases in which extraction is performed without iridectomy, and then only until the anterior chamber is reëstablished.

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#### POSITIVE CENTRAL SCOTOMATA, AND THE CAUSE OF DISTURBANCE OF VISION IN DISEASES OF THE RETINA.

TREITEL (*Archiv für Ophthal.*, xxxi. 1) distinguishes between scotomata of the retina and scotomata of the optic nerve. The first appear to the patient as dark spots, while the latter are only discovered by the physician after an examination of the field. These are known as negative, while the former are called positive. Positive scotomata are met with in retinal apoplexy, in hemorrhagic retinitis, and in retinitis albuminurica, in which symptomatic night-blindness does not occur. Positive scotomata are to be regarded as entoptic appearances. Here the transparency of the retina suffers. These positive scotomata are due to the shadow of these opacities, which is proved by the conditions under which the patients see the gray spot most distinctly, and also by testing the parallax of the shadow. The color-sense in these

cases suffers because the cones of the diseased part of the retina are covered. Here is the difference between anomalies of the visual sense occurring in disease of the retina, and similar anomalies occurring in disease of the optic nerve. The principal difference between diseases of the retina and diseases of the optic nerve does not lie in the loss of the color-sense, which is met with in both, but in the manner in which this loss occurs.

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#### ABORTION FOR THE ALBUMINURIC RETINITIS OF PREGNANCY.

HOWE has analyzed (*Amer. Journ. of Ophthalm.*, May and June, 1885) all the published cases of this kind which he could find as far back as 1870, in order, if possible, to formulate some of the indications as to the time when interference may be necessary. This analysis tends to show that when the vision begins to be impaired only in the last two weeks of pregnancy, recovery follows almost invariably. Of those cases described as being in the eighth month, or thereabouts, when the retinitis began, not one-half recovered, and several did not materially improve. Finally, when the retinitis began earlier, and when nature did not interfere by bringing on a miscarriage, and when the patient escaped with her life, it was only to remain permanently blind. The time at which the retinitis appears, and its degree, are perhaps the more important factors in the problem, but next to these the quantity of albumen, and the relative time of its appearance, give an indication as to the probable result. Howe infers that the induction of premature labor is warranted when the retinitis appears in a comparatively early stage of pregnancy, and persists in spite of proper treatment; but is not warranted in the last few weeks of pregnancy, in spite of the greater ease with which it is accomplished, unless the inflammation is unusually severe.

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#### A CASE OF INJURY TO THE EYE FROM A STROKE OF LIGHTNING.

LAKER reports (*Arch. of Ophthalm.*, xiv. 2 and 3) a case of this rare injury in a soldier, aged twenty-three. A bolt of lightning passed through a window into the room where the soldier was, and he fell unconscious to the floor. When he regained his senses he was totally blind, and suffered for several hours from violent tonic and clonic spasms of the lower extremities. There was no external trace of injury on any portion of his body. He remained totally blind for a week, and then his vision began to return and improved for two weeks, since which it remained unchanged.  $R. E. V. = \frac{6}{LX}$ ;  $L. E. \frac{3}{LX}$ .

Both pupils were eccentric and oval, rather dilated and sluggish. There were no posterior synechiæ. The tension was normal. There were numerous punctate opacities in the anterior cortex of the right lens. The retinae were hazy and brownish-red, and the outlines of the disks indistinct. The vessels had ill-defined contours, and were reduced in calibre. Both optic disks were discolored grayish. The macula in the right eye presented a round, bright red appearance, surrounded by a border of pigment. In the left eye the region of the macula showed a large, bright red, rhomboid spot, also surrounded with pigment. In the right eye there were also numerous, zigzag patches of pigment near the disk, beneath the vessels. In the right eye the



light-sense was reduced to one-quarter (photometer scale of 5 mm.), and in the left eye to  $\frac{1}{5}$  (photometer scale of 15 mm.); color-sense was normal for both eyes. The presence of a central scotoma could not be detected, nor could the field of vision be tested, owing to the absence of a perimeter. The lightning-shock, no doubt, produced neuro-retinitis with retinal hemorrhages, alterations at the macula, and slight opacity of the lens, which remained unchanged for a period of six months.

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#### EXCESSIVE GLANDULAR DEVELOPMENT IN THE OPTIC DISK IN A CASE OF ATYPICAL RETINITIS PIGMENTOSA.

REMAK relates (*Centralbl. für prakt. Augenheilk.*, Sept. 1885) a case of this kind occurring in a man, aged fifty-two, who had lost the *right* eye fifty years before, from an injury. This eye had never shown any signs of irritation, and was a marked example of phthisis bulbi. The sight of the *left* eye began to fail at the age of seven, and by the time he was fifteen he could no longer read. For a year he had only quantitative perception of light. On examination of the left eye there was found a senile cataract with thickened capsule and fluttering iris, and very uncertain projection. The lens in its capsule was extracted under cocaine, iridectomy having been previously performed; and the wound healed smoothly. The resultant vision was only equal to counting fingers at a distance of about twenty inches, and the reason for this was revealed by an ophthalmoscopic examination. There were cord-like opacities in the vitreous, and the papilla presented an appearance resembling a piece of large intestine; a conglomerate of five or six rounded and oval bodies of an intense bluish-white color, arranged in a curve with its convexity outward (inverted image) and its concavity inward. Their surface extended above the level of the retina, and showed a number of very small blood-vessels. The rest of the retina was entirely devoid of vessels, and scattered over the fundus were patches of deep black and brown pigment, while above and below the glandular development there was entire absence of the pigment epithelium.

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#### OPHTHALMOMETRY WITH THE OPHTHALMOMETER OF JAVAL AND SCHIÖTZ.

BURNETT recommends (*Arch. of Ophthal.*, xiv. 2 and 3) strongly the use of this instrument in determining errors of refraction. He considers it the most practical of all the instruments of precision which are employed in the diagnosis of astigmatism. The examinations can be made with great rapidity, as less time is consumed than even an expert would take in making the same determination with the ophthalmoscope. It is of most essential value in cases of astigmatism of high degree, and especially in mixed astigmatism. He thinks it will render valuable indications as to the kind of section likely to give a minimum of deformity in the corneal curvature, by making a number of accurate ophthalmometric measurements of eyes operated on for cataract by extraction. Another field for usefulness of the ophthalmometer will be in the selection of a place for making an iridectomy in cases of leucoma of the cornea, as the instrument will show at once which portion of the corneal surface is most nearly regular.



CONTRIBUTION TO THE KNOWLEDGE OF THE REFRACTIVE CONDITION OF  
THE EYES OF INFANTS AND YOUNG CHILDREN.

GERMAN'S investigations (*Arch. of Ophthal.*, xxxi. 2) are based upon an examination of the eyes of 110 children, from birth to three months old. He found that the eye of the nursing infant is strongly hypermetropic, but that the hypermetropia steadily diminishes with advancing age; in other words, that the eye gradually changes with its growth from a weaker to a stronger refraction. Hence the physiological refractive condition is that of the hypermetrope.

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CONGENITAL COMPLETE PARALYSIS OF THE MUSCLES SUPPLIED BY THE  
MOTOR OCULI NERVE, WITH THE EXCEPTION OF THE IRIDES AND  
CILIARY MUSCLES.

TILLEY reports (*Amer. Journ. of Ophthal.*, Sept. 1885) a case of this kind in a boy, aged twelve, of normal mental and physical development, with no family history to account for the condition. The appearance, attitude, and gait of the patient were pathognomonic of the defect. The divergence of the axes of the eyeballs was so great, that double vision was absent throughout the extent of the visual fields. An examination of the vision showed: R. E.,  $\frac{6}{XXXVI}$ ; L. E.,  $\frac{6}{C}$ , and no improvement by glasses. He could read Sn. 0.8 at 6 inches with either eye. The color-sense was normal. There was complete absence of the patellar tendon reflex. Tilley thought that the seat of the lesion was in the cerebral substance, a view somewhat strengthened in his mind by the diminution of visual acuity. It is difficult to understand, on this hypothesis, how the fibres supplying the irides and ciliary muscles should have escaped. It is possible that the abducens nerve may have supplied the motor fibres.

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TENOTOMY OF THE INFERIOR OBLIQUE MUSCLE.

LANDOLT describes (*Arch. d'ophthal.*, Sept.-Oct. 1885) his method of operating for tenotomy of the inferior oblique as follows: After fixing the skin on a level with that part of the inferior orbital margin which corresponds to the insertion of the muscle, a short, deep incision is made through skin and orbicular muscle down to the inferior margin of the orbit. After arresting the hemorrhage by aseptic iced applications, the lips of the incision are separated by hooks, and the wound examined for the tendon of the muscle, which is recognized by its color and the oblique direction of its fibres. The muscle is then seized with forceps or by means of the strabotomy-hook, and divided with either scissors or bistoury. The wound is then closed by a single suture. The course and insertion of this muscle probably exert some influence in the production of a venous stasis in the uveal tract, for beneath it may be always found one of the vasa vorticosa. This is of some importance in connection with one of the theories as to the production of progressive myopia.

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A CASE OF PERIODIC PARALYSIS OF THE OCULOMOTORIUS.

MANZ (*Berl. klin. Woch.*, Oct. 5, 1885) prefaces a very detailed account of a case of this kind, occurring in his own practice, with a brief *résumé* of the

cases hitherto published by Weiss, Thomsen, Remak, and others. The case which he has himself so carefully described, occurred in a young man, age not given, who had complete paralysis of all the branches of the right third nerve, with vision in the right eye of  $\frac{4}{VI}$  and a hypmetropia of D. 0.25; the left eye being normal in all its functions. There was very marked limitation of accommodation and a boring pain in the orbit behind the eye. He had suffered from right hemicrania or migraine from his earliest childhood, but the first occurrence of the paralysis was in his fourteenth year, following a severe attack of hemicrania. Since then the paralysis has occurred at intervals of four or six weeks, and was always preceded by the hemicrania, which grew less and gradually disappeared after the occurrence of the paralysis. The duration of the latter varied from a day to several weeks. There was never any disturbance in the other motor or sensory nerves. In the intervals of the paralysis there remained a somewhat dilated pupil and a slight divergence of the eye. The patient was otherwise perfectly healthy, and had always been so. Abuse of alcoholics always brought on the paralysis. The case in some respects resembled one of migraine, but, on closer examination, it will be seen that each attack was simply an exacerbation of an existing diseased condition, due either to a local extension of the focus of disease, or to an increase in the degree of paralysis from compression of the nerve-fibres. Accompanying the lesion there might be either a transient cerebral hyperæmia or cerebral anæmia. If the paralysis be of central origin, we must locate the lesion in that region of the brain in which the nuclei of origin of the branches of the third nerve are found, stretching from the third ventricle backward through the aqueduct of Sylvius; a so-called nuclear paralysis. If the paralysis be peripheral, we must search for the focus of disease somewhere in the nerve-trunk between its point of exit at the anterior border of the pons and its entrance into the wall of the cavernous sinus. The unilateral character points to a peripheral origin of the disease. Our knowledge of the anatomical changes in recurrent paralysis of the oculomotorius also points to a peripheral origin, a disease of the nerve-trunk itself. No positive opinion can be formed as to the location of the lesion in these cases, but an additional point in favor of the peripheral origin of the disease lies in the fact that no one has as yet furnished proof of the existence of an intracerebral lesion as the cause of an isolated paralysis of a single branch of the third nerve on one side.

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A CASE OF ABSCESS OF THE ORBIT; TOTAL BLINDNESS; ATROPHY OF THE DISK AND OBLITERATION OF THE RETINAL VESSELS, FOLLOWING AN UNSUCCESSFUL ATTEMPT TO EXTRACT THE UPPER CANINE TOOTH.

BURNETT reports (*Arch. of Ophthal.*, xiv. 2 and 3) an interesting case of great swelling of the eyelids and face, following an unsuccessful attempt to extract the upper canine tooth, in a negro, aged 35. Burnett saw the case four months later, when the eye was in proper position and its motility perfect. There was a depression at the outer part of the lower orbital ridge, extending four-fifths of an inch downward into the cheek, caused by exfoliation of bone. There had undoubtedly been an abscess of the maxillary antrum, caused by a fracture of its walls from the forcible but unsuccessful

attempt to extract a tooth, which led to the inflammation in the orbit. Further evidence of this was the destruction of a part of the superior maxillary bone at the lower edge of the orbit.

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CONTRIBUTION TO THE KNOWLEDGE OF THE RETROBULBAR PROPAGATION OF CHOROIDAL SARCOMATA, AND TO THE QUESTION OF THE COURSE OF THE NERVE-FIBRES IN THE REGION OF THE OPTIC NERVES.

JATZOW'S paper (*Arch. f. Ophthal.*, xxxi. 2) is a long and interesting contribution to our knowledge of a subject which is even now a moot point in the minds of some ophthalmologists. As a result of his examination of patients and his microscopical investigations of cases of choroidal sarcoma, it is his belief that in every case of tumor of the optic nerve and of choroidal tumor, a careful examination should be made of the field of vision of the sound eye. He is convinced that the existence of a defect in the temporal half of the field of vision, which has begun in the infero-temporal quadrant, is pathognomonic of an extension of the neoplasm from the optic nerve-fibres to the chiasm. He thinks that the uncrossed bundle of nerve-fibres occupies the lateral or outer half of the optic nerve immediately behind the chiasm. In his opinion, the fibres destined for the temporal half of the macula must occupy the temporal half of the optic nucleus, while the fibres destined for the inner half of the macula must occupy the inner half of the optic nucleus, and that the fibres destined for the outer and inner parts of the periphery of the retina must occupy the respectively corresponding parts of the transverse section of the optic nerve. The paper is a complex one, but will repay careful reading.

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MICROCHEMICAL INVESTIGATIONS INTO THE ORIGIN OF THE PIGMENT IN THE MELANOTIC TUMORS OF THE EYE.

VOSSIUS (*Arch. f. Ophthal.*, xxxi. 2) has undertaken to solve the question whether the pigment of melanotic tumors comes directly from the coloring matter of the red blood-corpuscles, or whether it is produced by a metabolic activity of the tumor-cells from the blood-plasma circulating in the tissue. He employed both Perls's and Quincke's method of investigation, and used also the method of coloring with eosine recommended by Merkel. The result of his investigations convinced him that the greater part at least of the pigment of melanotic sarcomata comes from the red blood-corpuscles.

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GOUTY AFFECTIONS OF THE EYE.

LYCHON (*Recueil d'ophthal.*, September, 1885) sums up his conclusions in regard to the effect of the gouty diathesis on the eye as follows: 1. Gout produces in the skin and conjunctiva of the eyelids a dry eczema, lithiasis, and a peculiar form of conjunctivitis. 2. It produces in the cornea a calcareous degeneration of the epithelium. 3. It causes simple and complex inflammation of the sclerotic. 4. It causes iritis and irido-choroiditis of a special character. 5. It has a marked tendency to produce hemorrhagic glaucoma. 6. It causes characteristic exudations in the retina. 7. It gives rise to sclerosis of the lens. 8. It gives rise to thrombosis of the intracranial and intraocular vessels, and consequent partial or total hemianopsia, or a more or less complete blindness.



## OTOLOGY.

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 UNDER THE CHARGE OF

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 THE ACOUSTIC VALUE OF THE AURICLE.

In a case of traumatic defect of the auricle, in a man forty-six years old, BÜRKNER embraced the opportunity to test the acoustic function of the auricle (*Archiv für Ohrenheilkunde*, Bd. xxii. p. 201, Aug. 1885). He corroborated the observation of Kessel (*Ibid.*, Bd. xviii. p. 120), viz., that the auricle is of value in the perception of sound, so long as the latter does not fall upon the ear, in the direction of the axis of the external auditory canal. The part played by the auricle, in the perception of quality of sound, as set forth by Mach, C. H. Burnett, and Brown, the author could not test, as the patient possessed no musical sense. Bürkner, however, was able to determine that the auricle has power to aid in the detection of the direction of sound. How far the hearing in this case would have been modified by the loss of the tragus, which, according to Politzer and others, possesses a certain influence in hearing, was not determined. The case, however, was confirmatory of the view that the *auricle aids in the recognition of the direction of sound, and in the accurate perception of sound which does not fall directly upon the ear in the line of the axis of the auditory canal.*

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 THE COMPARATIVE RESULTS OF DIFFERENT METHODS OF TESTING THE HEARING.

PROF. BURCKHARDT-MERIAN, in a paper read at the Third International Otological Congress, Basle (*Archiv f. Ohrenkeilk*, Bd. xxii. pp. 177-194), admits the existing want of a fixed test for the hearing, and is inclined to the views of Wolf, that the human voice is the best test at our command; but, in addition to the voice, he thinks we have other means of testing which should be employed in conjunction with the voice-tests.

According to his view, a perfect acoumeter should possess the following characteristics:

1. Exact power of determining the functions of the acoustic nerve, so that different observers in different countries can record the results in exactly the same manner.
2. The power to determine accurately the result of treatment.
3. Accuracy in deciding the position and the prognosis of the disease, from the result of the test of hearing.
4. Employment of the facts obtained from post-mortem examinations, and, hence, the ability to explain pathological discoveries, and aid in the perfecting of the physiology of the acoustic nerve.

"Such an instrument does not, and probably never will exist. In comparison with such, the finest musical instrument in existence is but a child's toy."



The author's mode of testing the hearing is as follows:

First. With Politzer's acoumeter, which has become with many aurists a substitute for the watch.

Secondly. The test with speech is carried out by whispered words at a maximum distance of six metres, which is considered the limit of normal hearing for words thus uttered.

Thirdly. A test is essayed by means of high notes, in which are employed König's rods,  $ut^7$  or  $c^5 = 8192$  vibrations a second, up to  $ut^{10}$  or  $c^8 = 65,536$  v. s. By this means even the most unmusical person can be easily tested.

Finally. A test for the perception of Galton's pipes is made. These furnish notes of from 6461 to 84,000 simple vibrations per second. They have the good quality of being small and convenient, and of maintaining their notes quite a long time, which is not possessed by the König rods. Such a pipe knows no interval, so that lacunæ in the perception of notes can be detected.

It appears that the width of the auditory canal has no influence on hearing.

The results of Burckhardt-Merian's acoustic tests are as follows:

I. In a series of cases it is shown that in persons of all ages, affected in hearing, bone conduction is so powerful that the finest closure of both auditory canals cannot effect a weakening of perception of König's rods nor of Galton's pipes.

II. Generally (especially in children) a collection of cerumen does not reduce the hearing for the test-rods or Galton's pipes, yet the reverse is not unfrequently the case, so that with a collection of wax combined with deafness for high notes, it is impossible to make a conclusion as to a possible further affection of the auditory apparatus. In cases of obstruction of the ear by collections of cerumen, the perception of whispers is chiefly interfered with, while that for the acoumeter is less so.

III. Exudation in the tympanic cavity interferes in the greatest degree with the perception of whispering, and often also that of the acoumeter, but only in rare instances with the hearing of high notes, and then perhaps it is due to pressure upon the round window.

IV. Perforations in the membrana tympani, even when the malleus and anvil are destroyed, increase the perception of high tones, but disturb chiefly the hearing for whispers, less than for the acoumeter. Conversely there occurs, especially in the loss of the anvil, a delicacy of hearing for whispers, while loud words are heard with difficulty.

V. Excessive hydrostatic pressure in the labyrinth diminishes in the highest degree the perception of high tones, and also nullifies in general the hearing powers. If, however, in such cases the hearing remains normal, or not markedly diminished, it is to be referred to the regulation of the entotic pressure effected by the aqueducts.

VI. If with relatively normal hearing for whispers and the acoumeter, high notes are either not perceived, or only imperfectly so, it indicates an affection of the cochlea. Thus, after exposure to explosions, discharge of fire-arms, loud locomotive whistles, etc., in addition to feeling uncomfortable in the ear, it is found that those thus exposed do not perceive accurately high notes, while they continue to hear normally both the acoumeter or watch and whispered words. It is entirely justifiable, in the author's opinion, to refer the lesion in such cases to the cochlea.

VII. Adhesive processes, which diminish or greatly reduce the perception of whispered words, also impair the hearing for high notes. In such cases the note G<sup>4</sup> Sol<sup>3</sup> constitutes the highest limit.

VIII. When in those who are very hard of hearing an abnormally acute hearing for high notes can be detected, while speech conveyed to them by means of the hearing trumpet is not well understood, there is every probability that the case is one of ankylosis of the stapes.

IX. An equal reduction of hearing for the acoumeter, whispers, metallic rods, and Galton's pipes, may be considered an evidence of disease of the internal ear.

X. Relatively good perception for high notes with simultaneous deafness for low notes, sometimes accompanies the most intense forms of deafness.

XI. Galton's pipes are indispensable in the discovery of lacunæ in the scale of perception of notes.

XII. Deaf-mutes and very deaf subjects may still retain relatively good hearing for high notes.

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#### THE ACTION OF COCAINE IN EAR DISEASES.

DR. F. KRETSCHMANN, of Halle (*Archiv für Ohrenheilk.*, Bd. xxii. p. 243), KIRCHNER (*Deutsche med. Wochenschrift*), ZAUFAL (*Præger med. Wochenschrift*, No. 7, 1885), DR. A. G. HOBBS, of Atlanta, Ga. (*Archives of Otol.*, vol. 14, p. 109), and DR. C. H. BURNETT (*Trans. Amer. Otol. Soc.*, July, 1885) have given testimony as to the negative results with cocaine in its local action in painful diseases of the ear.

Kretschmann employed in all his cases a five per cent. solution of the hydrochlorate. The application was effected either by instillation or by soaking cotton and passing the latter down the auditory canal upon the membrana tympani, or upon a point chosen for incision. The period allowed for the application to take effect was not less than fifteen minutes, nor more than twenty minutes. In affections of the nares and nasopharynx, the application was made by the camel's-hair brush directly to the spot to be anæsthetized, and the operation repeated, if necessary, every five minutes. The conclusions are as follows:

1. In operations on the membrana tympani, the anæsthetic action of cocaine (five per cent. solution) is uncertain.

2. In operations on the tympanic mucous membrane, cocaine has an anæsthetic effect. It fails, however, if the cut be deep enough to involve the subjacent bone.

3. In operations on the nasal mucous membrane, cocaine has both an anæsthetic effect and one which abrogates reflex susceptibility.

4. In rhinoscopy, cocaine allays gagging and relaxes the soft palate.

Kirchner began his observations with a two per cent. solution, but found that nothing weaker than a twenty per cent. solution was sufficient to produce anæsthesia of the membrana tympani. But, even with this strong solution, the result is by no means certain, an experience similar to that of Zaufal, who has had negative results in producing anæsthesia of the membrana tympani with solutions of cocaine. But he finds that, in large perforations of the membrana, the mucous membrane can be reached and anæsthetized by cocaine, so that granulations can be removed without pain.

Dr. A. G. Hobbs, of Atlanta, Ga., adds further testimony to the uselessness of the local application of hydrochlorate of cocaine, except to mucous membranes. He claims to have relieved the pain of otitis media acuta, in several instances, by forcing a few drops of a two per cent. solution, and later of a four per cent. solution through the Eustachian catheter into the Eustachian tube, and also that in one case the treatment seemed to dispel a tinnitus which had existed for some time. But he seems to have lost sight of the fact that catheterization of the tube and inflation alone will often relieve pain in the ear, and also tinnitus. Unfortunately, writers on new subjects often prove too much, and thereby lead others, of even less experience than themselves, to undertake procedures in treatment in no way warranted by the experience of more skilful surgeons.

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#### THE LOCAL USE OF BRUCINE IN PAINFUL AFFECTIONS OF THE EAR.

In this connection attention is called to the anæsthetic effects of brucine in ear diseases, as first announced by DR. C. H. BURNETT, in a paper read at the meeting of the American Otological Society, July 12, 1885, in which he reported a negative experience with the use of cocaine as an anæsthetic in the ear, but very good results from applying *five per cent. solutions of brucine to the ear*. Its local application as an anæsthetic to the ear was tried in the Philadelphia Polyclinic, at the suggestion of Dr. Thomas J. Mays. The solution employed was five per cent. of brucine, to which hydrochloric acid had been added in the proportion of five drops to the gramme, and in all the cases treated with this solution of brucine, the relief to pain has been prompt and complete, a result far more satisfactory than any obtained by using cocaine solutions in the ear. The applications to the ear were made by means of cotton, soaked with brucine solution, and mopped over the fundus of the canal (*Transactions of American Otological Society*, 1885).

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#### DISEASE OF THE LABYRINTH COMPLICATING SCARLATINAL DIPHTHERITIS.

DR. OSCAR WOLF, of Frankfort-on-the-Main, reports (*Archives of Otolaryngology*, vol. xiv. pp. 137-157, Sept. 1855) three cases of special value, because there are very few, if any, instances of severe scarlatinous otitis accompanied by severe disease in the labyrinth, in which the course of the disease has been watched from the beginning by an aurist.

In the first case the diphtheritic process extended to the middle ear by the Eustachian tubes, and complete and permanent loss of hearing then ensued. The patient was a boy six and a half years old. The membrana tympani was swollen and infiltrated. Subcutaneous injections of pilocarpin were suggested, but were declined by the father of the patient.

The second case is of greater interest, because pilocarpin injections were used with apparent advantage. It was a case of "severe scarlet fever with diphtheria of the post-nasal pharynx and an extension of the diphtheritic process, *per tubam*, to both tympanic cavities." The patient was a girl seven years old, of healthy parents. The case was severe from the outset, the eruption becoming confluent in a number of places, and dark red in color. The pharynx was coated with diphtheritic membrane, and the cervical glands became swollen. The temperature ranged between 104° and 106½° F. for



eight days. The prostration was great. Salicylic acid was the drug given chiefly. The mucous membrane of the tympanic cavity was brownish-red, swollen, and spotted with yellowish membrane.

The treatment to combat the symptoms of labyrinth disease was begun by injecting 0.005 grm.—*i. e.*,  $\frac{1}{200}$ th of a grain—under the skin of the neck, twice daily, increasing the dose  $\frac{1}{40}$ th of a grain every two days, until the maximum,  $\frac{1}{8}$ th of a grain, was reached. A few minutes after each subcutaneous injection a half wineglass of sherry was given. In addition to this, a solution of boracic acid and a two per cent. solution of carbolic acid were used alternately to syringe the ear, and the mastoids were painted with tincture of iodine twice daily and the air douche was used once daily. The physiological effect of the pilocarpin was complete, profuse sweating and salivation following each injection. An increased secretion was also observed to come from the ears, accompanying the profuse sweating and salivation. In the course of six days sounds began to be perceived by the patient; high notes first, and then lower ones. In ten days sounds like the loud singing of a bird, became painful to the patient. This should be taken as a hint to be very careful in testing the hearing in those suffering from disease of the labyrinth. In five days from this time the patient appeared to understand single words. His head became freer, and subjective sounds were no longer complained of. In five days later only  $\frac{1}{8}$ th of a grain of pilocarpin was injected every two days. Up to this time thirty injections had been made in fifteen days, and the hearing was so much improved that the watch could be heard in contact, and conversation at two yards. The left ear remained very imperfect in hearing.

Vertigo and intense trembling, with inability to hold up the head, were marked in the beginning of this case, but after six or eight injections of pilocarpin the child could sit erect. At the time of leaving its bed, seven weeks from the beginning of the disease, the waddling gait was very evident and there was also a tendency to fall forward and toward the left. The waddling gait and the subjective sounds continued eight months.

Ten days later—*i. e.*, on January 30—another change was made in the injections of pilocarpin, *viz.*, from this date to February 17, nine injections were made, when they were entirely discontinued. Under boric acid insufflations the discharge in the right ear ceased on February 22. The left ear remained diseased longer than the right ear and never recovered hearing to the same extent. By April 1st loud conversation could be heard at two yards, in the left ear, but whispers could be heard by the right ear at four yards. In the fall of the same year, the child returned to school and made good progress in her studies, her hearing being good, and all noises in the ear having ceased.

The third case is one of scarlatina and diphtheria, with parotitis on both sides. The patient, a little girl, four years old, in good health previously, was attacked with scarlatina on December 15, 1884. On the fourth day the temperature rose from 103.3° to 104.3° F., and diphtheritic membrane appeared in the nasopharynx, from which it advanced to the arches of the palate. On the sixth day there was considerable impairment in hearing, which constituted the first aural symptom. On the eighth day, anasarca of both eyelids, hands, and feet appeared. Urine light colored, copious, but without albumen. Diphtheritic masses still were syringed from the ears, and over the left mastoid there appeared a painful swelling. The patient still appeared to understand



loud speech. On the next day  $\frac{1}{13}$ th of a grain of the muriate of pilocarpin was injected under the skin of the neck. Two hours later there was moderate perspiration, but great depression and restlessness. This treatment was not repeated the next day, on account of the patient's weak condition. Twenty-two days later ringing in ears was complained of, and ten days later, in attempting to walk, the child complained of dizziness. The next day a second attempt to walk was made, and there was noted a tendency to fall toward the right side.

From the evidence of disturbance in the sound-perceiving apparatus (internal ear), it was decided to resume the use of pilocarpin. Twenty-six injections of pilocarpin were given in the course of two months, and the understanding for speech increased considerably. The general condition of the child by this time was very good.

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#### TREATMENT OF CHRONIC CATARRH OF THE MIDDLE EAR.

At the recent meeting of the American Otological Society, the subject which excited the most interest, if we may judge by the discussion elicited, was chronic catarrh of the middle ear. The papers read by DRs. W. W. SEELY, of Cincinnati, and CHARLES H. BURNETT, of Philadelphia, showed that the great number of cases of deafness caused by chronic catarrh of the middle ear, associated with chronic rhinitis, render this form of aural disease of chief importance to aurists, and they also showed that there can be no rational, and, hence, hopeful, treatment of these cases, without the most judicious treatment of the nasopharynx.

The old-fashioned, perfunctory examination of the membrane, and of the throat, during a visit to the family doctor, or to some specialist, without examination of the nares, the old statement that the drums are thick and the throat "relaxed," or some placebo-statement, will not now suffice. These cases of deafness are not caused by faucial disease, though this part of the air-passages may be affected simultaneously. The posterior nares, the nasopharynx, the anterior nares, and the turbinated bones, are the seat of the original and causative disease, and hence demand the strictest attention of any one treating ear diseases.

As declared by the writer of the first paper, "these cases require a vast amount of time, care, and patience." Most of them are, at last, amenable to treatment, but it is impossible to say in any given instance, at the outset, how long a time will be required to produce beneficial results with the treatment. It is not possible to base a prognosis on hearing-tests, bone-conduction, etc., and, therefore, no case should be dismissed from treatment without, as Dr. Seely aptly terms it, the "test by trial"—*i. e.*, by treatment.

The second paper regards all cases of so-called chronic aural catarrh as rhino-aural affections, falling into one of two classes, viz., the hypertrophic or the atrophic, chiefly into the former. The treatment, of course, differs greatly for the two forms—and it is because this difference has not been recognized, and treatment when applied to the nares and nasopharynx has been too often of a routine and perfunctory nature, that frequently more harm than good has occurred to the nares and the middle ears. In the hypertrophic form the treatment must be much gentler, of a mildly astringent quality, rather than

a stimulant form, which is adapted to the atrophic forms of rhinitis and rhino-aural disease. It was also shown that the appearances of the membrana tympani are so variable in the hypertrophic form that nothing can be predicated of the tympanic disease by simple inspection of the membrana. In the atrophic form of chronic aural catarrh, the appearances of the membrana being more consistent and invariable, the surgeon can predicate more of the tympanic disease, from simple inspection of the membrana, viz., that it is sclerotic in form. From this variability in the appearances of the membrana, in the hypertrophied form of aural catarrh, it follows that changes in the membrana, taken alone, are of little moment respecting the hearing. The lesions most competent to induce acoustic disturbances are apt to be situate upon the ossicula or upon the inner tympanic wall near the fenestræ.

It was, furthermore, urged that the aural surgeon must inspect the nares, and treat the various forms of nasal catarrh as they occur in chronic catarrh of the middle ear, laying much more stress upon the condition of the nares and nasopharynx than upon that of the fauces, so far as any casual relation between the latter and the deafness is concerned. Both papers enjoin the importance of great caution in the treatment of the nares, and the careful avoidance of overstimulation of these parts. Too often inflammation of the middle ears, and an increase of deafness, follow the injudicious treatment of the nares. Hence, the nasal douche, the post-nasal syringe, and snuffing of medicaments by the patients, are positively interdicted. It is also hazardous to entrust any form of inflation by the Eustachian catheter to the patient.

A word of caution is also given in the second paper regarding the use of the galvanocautery or any other severe means of removal of hypertrophies from the turbinated mucous membrane, or any other form of nasal obstruction. The cautery, like the nasal douche, is certainly open to the criticism that in some cases it excites inflammation of the nasopharynx, the faucial end of the Eustachian tube, and middle ear. The writer has seen several cases in which the operation on the nares excited acute inflammation in the middle ear. In two instances suppuration of the inner cavity and perforation of the membrana ensued, while in one instance a severe catarrhal swelling of the tube and deafness were the result.

Chief reliance is placed by the writer of the first paper upon emollient or mildly stimulating salves, and unguents applied to the nares, with the judicious use of the Eustachian catheter or inflation bag.

According to the writer of the second paper, good results are obtainable by the employment of spray carefully applied to the nasopharynx by the way of the anterior nares, and, in cases of acute congestion, by anodyne powders. In the hypertrophic form of naso-aural catarrh the treatment should be cleansing, astringent, emollient; while in the atrophic form it should be cleansing and stimulant. It may be set down as axiomatic that in the hypertrophic form *no* kind of nitrate of silver application is tolerated in the nares.

The throat symptoms can be combated by suitable gargles and sprays, or by direct application of preparations of tannin, chloride of iron, and iodine, made by the caustic holder directly to the diseased spots, under illumination from the forehead mirror, and not by indiscriminate swabbing, which is as injurious as it is unskilful.

## DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

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UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

PROFESSOR OF DISEASES OF THE THROAT AND CHEST, PHILADELPHIA POLYCLINIC.

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### RHINOSCLEROMA A PARASITIC DISEASE.

MM. CORNIL and ALVAREZ (*Annales de Derm. et de Syph.*, vol. vi., No. 4) describe a microbe which they have found in preparations from five cases of rhinoscleroma. The rods are always surrounded by a capsule which may contain one, two, or a group of four or five bacilli. These encapsulated rods, which are  $2\frac{1}{2} \mu$ . to  $3 \mu$ . long and  $0.4 \mu$ . to  $0.5 \mu$ . broad, contain colored granules resembling spores. They are found free in the tissues, between the reticular fibrillæ, around the large cells, in the interfibrillary spaces, or in the lymphatic vessels. The authors consider the presumption to be strong that rhinoscleroma is a parasitic disease.

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### ACUTE CORYZA A MYCOTIC DISEASE.

DR. AUSTIN FLINT, SR., (*Medical News*, October 24, 1885) favors the view that acute coryza is a mycotic disease, differing from influenza only in degree. This is an extension of Prof. Flint's recent assault upon the "taking cold" theory in general. Nevertheless, the effects of "cold" in exciting inflammations in various organs, or at least predisposing to such inflammations, are too well recognized to become a matter for doubt.

TREATMENT OF ACUTE CORYZA.—Several journals contain, copied from one another and variously credited, "a certain means of relieving the discomfort incident to a cold." It consists (DOBSON, *Lancet*, May 31, 1884) in pouring half a pint of boiling water over a drachm of pulverized camphor and inhaling the vapors for ten or fifteen minutes. Dry camphor vapor, *a la cigarette*, suggested by the notorious Raspail, has long been in good repute.

DR. SOLOMON SOLIS-COHEN (*Medical Times*, Philadelphia, August 8, 1885) reports good results from atropine at the commencement of the attack (gr.  $\frac{1}{120}$  repeated in four hours), and from ammonium salicylate (gr. x-xv every two hours until tinnitus aurium is produced) when the case has so far progressed that good results from atropine are not to be expected. Cinchonidine salicylate is recommended for influenza. For local application, erythroxyline hydrochlorate (suggested by Bosworth) and infusion of erythroxylin are advised.

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### ETIOLOGY, PATHOLOGY, AND HISTOLOGY OF CHRONIC INFLAMMATIONS OF THE NOSE AND NASOPHARYNX.

DR. JOHN N. MACKENZIE (*Medical News*, April 4, 1885; *New York Med. Journ.*, August 22, 1885) contributes the results of pathological studies upon acute and chronic inflammations of the nasal mucous membrane. In the



former communication he suggests the following classification by stages: I. Simple inflammatory rhinitis. *a.* Irritability of erectile tissue. *β.* Permanent dilatation of erectile tissue. II. Hypertrophic rhinitis. *a.* Dilatation with hypertrophy. *β.* Complete hypertrophy. III. Atrophic rhinitis. *a.* Commencing atrophy. *β.* Complete atrophy.

In the latter article, a microscopical section through the inferior turbinated bone of a man dead of Bright's disease, the result of long-standing mitral insufficiency, is presented as the probable picture of the histological changes in acute coryza. Another section illustrates dilatation with hypertrophy in chronic nasal inflammation. Dr. Mackenzie recognizes four modes by which the erectile spaces become obliterated in nasal inflammation. 1. By the contraction of newly formed intercellular fibrous bands. 2. By obliteration of their lumen by masses of lymphoid cells. 3. By the formation of thrombi. 4. By the process of septa formation. The author refers to the interdependence of chronic nasal and chronic antral inflammation, and the rarity of secondary involvement of the antrum.

The same writer (*New York Medical Journal*, September 12, 1885) refuses to "ascribe all diseases to the peripatetic excursions of a vagrant micrococcus;" nor does he consider dust the prominent factor that it is sometimes alleged to be in the localization of inflammatory disease in the nasopharynx. Variable climatic conditions, and defective assimilation from whatever cause, whether hereditary or acquired taint, or indiscretions or excesses of any kind, seem the principal exciting and predisposing causes of simple inflammations of the upper respiratory tract.

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#### TREATMENT OF CHRONIC CORYZA.

At the meeting of the American Laryngological Association, June, 1885, prominence was given in debate to the use of mild measures, such as persistent dilatation of the obstructed nasal passages by means of compressed tubes of laminaria, with efficient cleansing by means of slightly aromatized alkaline sprays; supplemented by great attention toward keeping the various emunctories in marked activity, and such general hygienic and dietetic regulations and constitutional medication as the individuality of the case might demand. —*Med. News*, July 4, 1885.

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#### OZÆNA.

DR. E. J. MOURE (*Soc. franc. de Laryngol.*, April, 1885; *Annales des mal., de l'oreille, etc.*, September, 1885) does not admit the incurability of ozæna. He proposes the use of the nasal douche with solutions of sodium bicarbonate, chlorate, or chloride, to soften and detach the crusts, followed by antiseptic irrigations, and insufflation of astringent powders; with constitutional medication by cod-liver oil or potassium iodide, the use of the Pyrennean thermal waters, and sojourn at the seashore.

DR. S. SOLIS-COHEN, in a communication to the American Laryngological Association (*Annales des Maladies de l'oreille, du larynx, etc.*, Sept. 1885), considers solution of hydrogen dioxide (10 vol., diluted, if necessary, with one or two parts of distilled and aromatized water) the best detergent and disinfectant.



tant in fetid coryza; and ascribes to it a certain power in stimulating the reproduction of healthy epithelium. Ethyl iodide, by inhalation, was also favorably mentioned.

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#### TAMPONING THE NARES; HEMORRHAGE.

For guiding the tampon, the compiler has for more than two years used simply a slender, flexible copper wire, headed at one end like a pin. The other extremity is turned up, at will, into a loop to which is attached the thread. The contrivance is passed in through the nostril and out through the mouth, and then cut from the thread, which now presents a free end at nose and mouth. Then the tampon is attached and pulled backward in the usual manner. Quite recently he has learned that, for the same purpose, the Japanese employ a spill made of a roll of narrow paper. A piece of bell wire can be utilized in an emergency. The copper wire, as above, answers admirably as a cotton-holder. It bends readily at any movement of the patient, and is thus rendered harmless. Small sections of wire can be mounted on holders and handles.

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#### CARTILAGINOUS THICKENING, WITH DEVIATION OF THE NASAL SEPTUM; SUCCESSFUL OPERATION.

DR. BEVERLY ROBINSON (*Med. Record*, N. Y., 1885, also private communication) reports a case of thickening of the cartilaginous septum with deviation, completely occluding the right nasal passage, but allowing a little air to pass through the left side on great exertion. Gradually increasing difficulty in nasal respiration, with anosmia, inability to sleep or eat with comfort, and secondary bronchitic asthma, had followed a blow on the nose four years previously. For five months the patient had been unable to close her mouth day or night. The thickened tissues were removed from the right side by means of Weir's gouge forceps, and, later on, soft metallic bougies were passed daily for twelve days. At one time, exuberant granulations were repressed by chloride of iron. At another, applications of monochloroacetic acid were made in both nasal passages. Complete relief from all annoying symptoms was afforded.

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#### HYSTERICAL SNEEZING.

CHARCOT (reported in *Brit. Med. Journ.*, July 25, 1885) showed at his clinic a girl aged sixteen, of a well-marked neurotic tendency, with hemianæsthesia on the left side, and hysterogenic zones in the right breast and in the left ovarian region, who is subject to attacks of paroxysmal sneezing. The fits are preceded by a feeling of globus hystericus, and consist in nervous cough, laughter, and spasmodic sneezing, sometimes also yawning. Opisthotonos frequently occurs. The patient sneezes from thirty to forty times a minute. There is no hypersecretion from the mucous membrane of the nose.

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#### HAY FEVER.

This subject, of perennial interest, has this year been more than usually prominent in professional circles. The observations of Daly, Roe, Allen,

Sajous, J. N. Mackenzie, in America, and Hack, in Germany, had concentrated upon local pathological conditions and local surgery. More recent observations have directed attention to erythroxyline (cocaine) as an efficient local palliative medicament. BOSWORTH (*Medical Record*, Nov. 11, 1884) shrewdly inferred the value of this drug from his observations of its control over turgescence of the nasal mucous membrane. DA COSTA (*Medical News*, December 13, 1884) announced similar views from theoretical considerations. SOLOMON SOLIS-COHEN reported (*New York Med. Journ.*, Feb. 28, 1885) to the January meeting of the Philadelphia Laryngological Association its power to prevent typical paroxysms, which were produced in a pronounced hay fever subject by titillation of the unanæsthetized nasal mucous membrane. MORELL MACKENZIE predicted probable benefit from its use in his recent monograph on hay fever (London, May, 1885). Experience during the season just passed has verified the correctness of these inferences, as evinced by communications in the journals of the two continents, too numerous for detailed notice.

The experience of DA COSTA (*Med. News*, Nov. 7, 1885), and others, that in severe cases the asthmato-bronchitic manifestations are often unrelieved, or but slightly modified, despite the allaying of pruritus, the reduction of intranasal intumescence and consequent relief to coryza, tallies with that of the compiler. This fact may be collated with an observation by SAJOUS (*Hay Fever and its Successful Treatment*, Philadelphia, 1885), that the special location for nasobronchial reflexes is limited to the posterior portion of the lower turbinated body (the sensitive area first announced by J. N. MACKENZIE in its relation to cough). This is a locality least accessible to the drug, when used by application through the nostril. Should direct medication to that tissue succeed in controlling the asthma, Sajous's views will be confirmed. In the compiler's experience, the best method for self-application is to apply a solution from a dropper directly upon the surface of the lower turbinated body, or to place against it a saturated wad, held in position for a few minutes by compressing the nostril. Tablets he has found far less efficacious, and sometimes actually irritating. A solution of less strength than four per cent. is rarely satisfactory, and one as high as twenty per cent. may be necessary. Some patients prefer to carry about with them solutions of various strength, to be selected according to the indications of the moment.

Cocaine has some drawbacks. Apart from the familiar local benumbing effects, there sometimes results, as mentioned by BEVERLY ROBINSON (*Med. Record*, Oct. 17, 1885), a secondary occlusion, attributed by this observer to paralysis of the turbinated structures. S. S. COHEN (*loc. cit.*) reported a mild coryza following its use, and has seen its contact with the nasopharyngeal membrane actually provoke paroxysms of asthma, an experience shared by the compiler. Unpleasant constitutional symptoms, among them nausea, headache, giddiness, inability to concentrate thought, and even syncope, have been noted and must be considered as indications for temporary withdrawal of the remedy.

Other methods of treatment remain to be considered. ROBINSON (*loc. cit.*) speaks highly of local application of carbolic acid (one part of the acid to three parts of glycerine).

The electric cautery, whether to remove redundant tissue (Daly and Allen),

to destroy sensitive nerve endings (Roe), or to produce "superficial organic alteration of the nasal mucous membrane" (Sajous), is still ardently advocated as a means of radical cure. That incurable, offending pathological tissues should be removed, whether by forceps, acids, cold or heated wire, or incandescent blade, is conceded. That destruction of all tumefiable tissues will effectually preclude occlusion by tumefaction, is self-evident. Destruction, however, is not cure, and the production of unnecessary cicatrices may prepare the ground for less benign disease in the future. While instances of permanent relief by these methods are sufficiently numerous, the fact cannot be ignored that cases of reported cure are sometimes compelled to seek treatment for recurrence. The choice between reliance upon a satisfactory palliative or resort to operative interference in the chance of permanent relief must be settled between patient and physician.

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#### REFLEX NEUROSES AND SEQUELÆ.

A great mass of literature is accumulating upon this topic. While some contributions are of real value, many are apparently hasty and ill-considered.

DR. JULIUS SOMMERBRODT, of Breslau (*Berliner klin. Wochenschr.*, 1885, No. 11), states that of 138 cases in which he had occasion to produce galvanocaustic destruction of hyperplastic nasal mucous membrane, 8 only were conscious of nasal disease. 20 were cases of vasodilator neurosis of the bronchial mucous membrane without asthma. In the severest case, the slightest probing of the terminal extremities of the swollen lower turbinated body of the right fossa excited a painful tickling beneath the sternum, and a paroxysmal spasmodic cough and gagging lasting for half a minute, or a minute, and then suddenly ceasing. The case was cured by electrocauterization. Other affections, proceeding from a similar cause, include laryngismus, migraine, asthma (52 cases, only 4 of which had nasal polypi; 2 typical cases of hay asthma unrelieved despite energetic cauterizations), pharyngeal hyperæsthesia, spasmodic sneezing, nasal cough, trigeminal and supracrural neuralgia. Most of these cases were relieved by electric cauterization under cocaine anæsthesia.

DR. FINCKE (*Moniteur de la Polyclinique*, June 7, 1885) reports sudden, numerous, and repeated attacks of epileptiform convulsions in an individual sixty-four years of age, whose right nasal fossa was obstructed by a racemose group of polypi. Removal of the neoplasms cured the epilepsy, and the patient has remained well for two years.

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#### MEMBRANOUS OCCLUSION OF THE POSTERIOR NARES, WITH OPERATIONS BY THE GALVANOCAUTERY.

DR. W. E. CASSELBERRY, of Chicago (*Journ. Am. Med. Assoc.*, Aug. 8, 1885, p. 148), reports an interesting case, occurring in a man of forty, a native of Russian Poland. Symptoms of obstruction of the left nasal passage had been complained of for thirteen years, with left-sided deafness and tinnitus aurium. Rhinoscopic examination showed the left choana to be covered almost completely by a tense membrane, approaching so closely to the septum that but a very narrow chink was left. The left Eustachian orifice was hidden from view. On the right, a similar membrane intercepted the view of the superior



turbinated body, the outer half of the middle turbinated body, and the Eustachian orifice. After preliminary training, the membranes were divided by a galvanocautistic knife introduced through the mouth, under rhinoscopic guidance. Three operations cleared the left side from all obstruction; and four were necessary upon the right.

The author gives a *résumé* of the literature of atresia narium. He considers the malformation in his case to have been congenital.

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#### OSSEOUS OCCLUSION OF THE CHOANÆ.

SCHRÖTTER, of Vienna (*Monatss. f. Ohrenh.*, etc., No. 4, 1885) describes a case in a female nineteen years of age, and presents a reference to nearly all other reported cases. His own case was bilateral. It was treated by boring through with an electric cautery and chiselling off the lateral edges.

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#### PRIMARY MALIGN TUMORS OF THE NOSE.

DR. E. SCHMIEGELOW, of Copenhagen, contributes to the *Revue Mensuelle de Laryngologie* (August and September, 1885) a valuable paper on this subject. He reports two cases of lupoid polypi (polypes lupeux), one of carcinoma and one of sarcoma. Operative measures (cold wire, electro- and chemical cauterization) were successful in each instance. The questions of diagnosis and prognosis are treated of at some length, and a number of important points are brought forward. The cases of lupoid polypi are compared by the author to the well-known tuberculous granulomata of the larynx, to which attention has recently been called by J. N. Mackenzie, Kidd, Schnitzler, and others; and the general analogy between lupus and local tuberculosis is accepted as indicating the identity of the affections.

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#### OSTEOMA OF NASOPHARYNX.

DR. THEO. STANLEY (*Med. and Surg. Reporter*, May 9, 1885) reports a unique operation by Prof. Garretson. The patient, a lady of fifty-five, had been troubled for eight years with gradually increasing occlusion of the posterior nares, until, finally, nasal respiration had become impossible. Diagnosis of an osseous tumor, springing from the base of the sphenoid bone, was made after palpation with a probe passed along the floor of the nose from in front, and with the finger passed behind the velum. The nasopharyngeal space was greatly encroached upon.

The patient being etherized, a buttonhole incision was made through the soft palate, and the overlying soft tissues were separated from the bony mass by means of a delicate chisel, curved on the flat, an incision having been previously made the whole length of the tumor. The osteoma and the body of the sphenoid bone were then drilled away by means of a burr attached to the surgical engine, "the only part of the body of the bone left being the half-cut-away shell of the pituitary fossa." The patient made a good recovery in fifteen days. This is a remarkable operation, and one that would have been impossible before the invention of the surgical engine.

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#### PHARYNGEAL BURSA.

DR. G. L. TORNWALDT, of Danzig (*Ueber die Bedeutung der Bursa Pharyngea*, etc., Wiesbaden, 1885), calls attention to the importance of this structure in



chronic diseases of the vault of the pharynx. He reports twenty-five cases of disease of the bursa, most of them cystic. The treatment consists of destruction of the cyst, chiefly by electric cauterly.

#### HARD CHANCER OF THE TONSIL.

DR. FRANK DONALDSON, JR., (*Med. News*, Aug. 15, 1885) reports a case, occurring in a prostitute, æt. twenty-nine. The lesion occupied the left tonsil, as a ragged, pultaceous ulcer, grayish-white, and not deeply excavated. The tonsil itself was somewhat enlarged. There was glandular enlargement on the left side. A hard chancre of the upper lip coexisted. The author reviews the literature of the subject, and gives in tabulated form the differential diagnosis between syphilitic ulcerations of the tonsil and epithelioma.

#### FUMIGATION IN CROUP AND DIPHTHERIA.

Fumigations from a five per cent. solution of phenic acid in glycerine, a teaspoonful at a time, is said to have been successfully used in croup at the hands of DR. AUMAITRE (*Gaz. Méd. de Nantes*, No. 8). The compiler has long used nebulized solutions of carbolic acid, with great satisfaction.

DR. DELTHIL, of Paris, who has for some time advocated the treatment of croup and diphtheria by fumigations with vapors produced by the combustion of a mixture of coal-tar and turpentine, gives in the *Journ. de Méd. de Paris* (*Med. News*, Aug. 18, 1885) further details of the treatment. If necessary, tracheotomy is also to be performed. The compiler has seen false membrane rapidly break down under this treatment, as claimed by the author. The dirtiness of it, however, is a serious objection. DR. MAJOR, of Montreal, has constructed an ingenious apparatus which, to some degree, obviates this objection.

#### SOLVENTS OF PSEUDO-MEMBRANE.

Papayotin, first recommended by ROSSBACH (*Berliner klin. Woch.*, 1881, No. 10) as a solvent for pseudo-membrane, and subsequently by many other observers, has recently been subjected to a severe test by DR. V. J. DRERER, of Moscow (*Vratch*, 1885, p. 15, *London Med. Record*, Aug. 15, 1885), who painted the parts every fifteen minutes during the daytime in thirty-one cases, using a five per cent. solution in water, with a two per cent. solution of sodium bicarbonate. The average duration of treatment was between two and three days; the mortality, sixty-two per cent. His conclusions are: 1. Papayotin produces a slight solvent action on diphtheritic membranes in the stage of their regressive evolutions; 2. Soft freshly originating membranes do not yield to the action of the drug; 3. Papayotin has no influence on the mortality and general symptoms in diphtheria. This is in marked contrast with the reports by SCHÄFER (*Berlin. klin. Woch.*, 1883, No. 52) of a mortality of less than four per cent. out of forty-seven cases. H. KRIEGE (*Jahrb. f. Kindh.*, xxiii., 1 u. 2, 1885) reports good results in fifty-eight cases. L. STUMPF (*Deutsch. Archiv. f. klin. Med.*, Bd. 36, H. 5 u. 6) doubts its utility. ROSSBACH (*Idem.*, Feb. 19, 1885) repeats his good opinion, and lays stress upon the importance of obtaining a good preparation, as many of the preparations are worthless.

## TREATMENT OF TUBERCULOSIS OF THE LARYNX.

DR. H. KRAUSE (*Berliner klin. Woch.*, July 21st) reports benefits so remarkable from local applications of concentrated solution of lactic acid (25 per cent. to 80 per cent.) as to lead him to indulge in hopes of its curative powers in the least unfavorable class of cases. It has to be applied rather roughly, and acts by production of slough, sometimes producing severe immediate effects. Ultimately, healthy granulations repair the ulcer and papillary excrescences disappear, swellings and infiltration subside, and the general subjective condition is much improved.

## INTERNAL ŒSOPHAGOTOMY FOR STRICTURE OF THE ŒSOPHAGUS.

DR. SANDS, of New York, reports (*N. Y. Med. Journ.*, Nov. 14, 1885) a case of stricture, of nineteen years' standing, from caustic potash swallowed at two years of age, which he had treated successfully by this method, and which exemplified the incorrectness of the common impression that all strictures of the œsophagus exhibit an invincible tendency to recontraction after operation.

## LARYNGECTOMY.

DR. ROSWELL PARK (*The Medical Press of Western New York*, Dec. 1885) successfully removed the entire larynx for intrinsic epithelioma, completely occluding the rima glottidis, from a man sixty-four years of age; a tracheotomy performed two weeks previously having failed to give relief. The patient at last report (private communication, Nov. 13th) was doing well, and expressed himself as much more comfortable than he had been for a long time. From other sources the writer was told that he was not wearing any artificial substitute for the larynx, and that he had reëngaged in the practice of medicine. The epiglottis was retained, and the first ring of the trachea was removed. The extirpation was conducted from below upward.

Partial laryngectomy has been successfully performed for epithelioma by GERSUNY (*Anzeiger der k. k. Gesellsch. d. A. in Wien. Sitzung*, April 24, 1885; *Int. Centralbl. f. Lar.*, etc., Nov. 1885).

DR. EUGENE HAHN, in a recent lecture (Volkmann's *Klinischer Vorträge*, No. 260, Leipzig, 1885), gives a table of 76 cases of complete laryngectomy, 65 for carcinoma, 9 for other neoplasms, and 2 for inflammatory conditions and their sequelæ; and 15 cases of partial laryngectomy and resection, 7 for carcinoma, 3 for other neoplasms, and 5 for inflammatory conditions and their sequelæ. To Hahn are accredited 7 of these complete laryngectomies and 3 of the partial ones; but in the text he describes 11 personal operations. His views, therefore, are of especial value. The patient's strength permitting, he delays preliminary tracheotomy until just before the laryngectomy. He prefers the horizontal position and deep chloroform narcosis, the trachea being protected from reflux of blood by a close-fitting sponge-compress around the canula.

The details of the operative procedure will vary according to the nature of the disease and the extent of the neoplasm, making the following divisions:

1. Complete excision with removal of most of the soft parts.
2. Complete excision with retention of the soft parts.

3. Unilateral excision.
4. Semi-resection, either anterior or lateral.
5. Partial resection.

The more of the soft tissues left, the sooner does the function of deglutition become restored.

Want of space prevents the extraction of further details from this valuable monograph.

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#### COCAINE IN CHOREA OF THE LARYNX.

DR. MASSEI, of Naples (*Bull. de la Soc. Franç.*, tome ii. f. ii.), reports a case of obstinate spasmodic cough in a child of five years, in which, after all treatment had failed, cocaine, locally, gave temporary relief. The child was removed from treatment too soon to effect a permanent cure. The compiler agrees with Dr. Massei in considering laryngeal chorea an unfortunate designation for this affection. DR. GAREL, of Lyons (*Lyon Méd.*, July 19; *Annales des Mal. du Lar.*, Nov. 1885), acting on Dr. Massei's hint, has succeeded in curing, by local application of cocaine, a case of choreiform cough associated with epileptiform seizures.

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#### FUNCTIONAL PARALYSIS.

DR. WM. PORTER (*Journ. Amer. Med. Assoc.*, Sept. 26, 1885) reports a case of aphonia of eleven and a half years' duration, in a male subject, æt. thirty years, in which phonation was permanently restored by two applications of the induced current.

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#### SPONTANEOUS PERFORATION OF THE TRACHEA AND ŒSOPHAGUS IN A TABETIC.

MM. TEISSIER and FAVEL report (*Annales des Mal.*, etc., Nov. 1885) a case of well-marked progressive locomotor ataxia, in which no definite history of syphilis could be obtained. The patient was found one morning in a comatose condition, and died that night. In addition to the characteristic lesions of the disease, there was found, *post-mortem*, a perforation of the trachea, situated in the posterior wall, about two centimetres below the inferior border of the cricoid cartilage, and communicating with the œsophagus. Prof. Teissier considers the lesion to be of nervous origin, due to trophic disturbance.

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#### FOREIGN BODIES IN THE ŒSOPHAGUS.

Successful cases of œsophagotomy continue to be reported, firmly establishing this therapeutic procedure. The compiler has ceased to attempt collecting all the reported cases. Other methods of removal deserve a little attention.

DR. GEISSELBERT, a dentist, of Furth, finding it impossible to extract from the œsophagus of a servant the rubber denture she had swallowed during sleep, pushed it into the stomach. He administered a quantity of cotton thread cut into small pieces, and beaten up with white of egg. The result of this novel and ingenious device was highly gratifying. Four days later, the girl passed *per anum* the plate overspun by the cotton.—*Deutsche med. Zeit.*, April 13; *Med. and Surg. Rep.*, June 20, 1885.

A patient of DR. C. H. HUNTER, of Minneapolis, swallowed a plate with two teeth. After a few whiffs of ether, preparatory to a proposed œsophagotomy, the foreign body suddenly passed into the stomach. Three days later it made a safe exit *per rectum*.—*Med. Record*, N. Y., June 6, 1885.

Spontaneous expulsion of teeth and plate, together with a piece of bone caught in the throat seventeen days after the accident, in a case in which the œsophageal bougie failed to detect the obstruction, but dysphagia and localized pain continued; and a case of removal of teeth and plate *per orem*, with curved forceps, are reported by MR. JOS. THOMPSON, in the *Brit. Med. Journ.*, Feb. 28, 1885.

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## DERMATOLOGY.

UNDER THE CHARGE OF

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### RECENT DERMATOLOGICAL LITERATURE.

DR. H. VON HEBRA's recent brochure of sixty pages on "Elephantiasis" (*Wiener Klinik*, viii. and ix., 1885) is an exhaustive *résumé*, presenting a clear exposition of the disease; a complete bibliography is added. Those desirous of ascertaining the recent views as to the pathology, especially as regards the significance given to the presence of filaria, and the more modern methods of treatment, will find the present monograph complete on these points, as well as on all others.

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### THE TREATMENT OF LUPUS BY COLD.

Accepting the bacillar theory of tuberculosis, and that lupus is a tuberculosis of the skin, C. GERHARDT (*Deutsche med. Wochenschrift*, No. 41, 1885) has, in view of the well-known effects of cold on the development of the bacillus, treated the disease with ice. The applications were made by means of ice bags, and kept in contact with the patches for two or three hours, twice daily. In several cases in which this plan of treatment was tried, and in which the ordinary methods had measurably failed, the result, at the end of several weeks, was satisfactory.

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### TREATMENT OF CHRONIC ECZEMA.

BOCKHARDT (*Deutsche med. Wochenschrift*, No. 30, 1885) describes his method of treating chronic eczema, applicable to localized, infiltrated areas. The crusts being removed, the surface is thoroughly scarified with a lancet, which is usually followed by slight bleeding only, amenable to pressure with compresses, after which the officinal solution of potassa is rubbed into the skin until the horny layer of the epidermis begins to loosen. The surface is



now washed off with water, and dressed with cloth spread with diachylon ointment or olive oil, bound on. After twenty-four hours this dressing is removed, and for the next twenty-four hours is supplanted by water compresses. The appearance of the wound at this stage resembles an ulcerating surface, which is further treated every three days with applications of a lunar caustic solution, or with pyrogallic acid ointment. Healing takes place in from two to four weeks.

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#### ETIOLOGY OF ECZEMA.

KRÖLL has contributed (*Berlin. klin. Wochenschrift*, No. 40, 1885) the histories of several cases of eczema bearing upon the production of disease through reflex action. The cases are essentially similar to one previously reported (*Ibid.*, No. 18, 1883) by the same writer. In these cases the eczematous eruption seemed dependent upon a local irritation, as a boil, a burn, or the action of tincture of iodine, the lesion usually first appearing about the seat of the irritation, and subsequently involving symmetrical or remote parts. The author holds the view that the eruption in these instances, as also in many others, is due to reflected irritation of the trophic nerves.

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#### A CASE OF PACHYDERMATOCELE, OR DERMATOLYSIS, ASSOCIATED WITH FIBROMA.

D. F. KEEGAN reports (*Indian Medical Gazette*, August, 1885) a case of pachydermatocele, or dermatolysis, associated with fibroma, occurring in a thin, spare man, a native of India, aged forty, who was successfully operated upon in the Indore Charitable Hospital of Calcutta. Two engravings accompany the article. The whole body was studded over with fibroma molluscum, varying in size from a pea to a walnut. In addition to the numerous fibromata, he was the subject of a huge pachydermatocele, which sprang from the left mammary region and hung down along his side, reaching to the level of the great trochanter of the femur. The tumor could be taken in the hand and laid on the supraclavicular region. The only portions of his body free from the smaller fibromata were the soles of the feet and the palms of the hands. Up to the age of ten years he was free from the disease, at which date the large growth began, the smaller tumors having formed since. His mother had a similar tumor of about half the size of his own, that grew in the same region. The growth is described as feeling like a long loose bag of integument, which, on being grasped between the fingers, gave arterial pulsations. The surface of the skin showed the follicles very distinctly marked, and the integument was thickened. The weight of the tumor after removal was two pounds and six ounces, and it consisted of thickened integument and areolar or connective tissue, well supplied with numerous bloodvessels. Dr. Keegan places the case on record to prove that the disease which Valentine Mott called pachydermatocele, and other authors call dermatolysis, is only an exaggerated form of fibroma molluscum.

The case resembles that figured by Virchow as the frontispiece to his work on *Tumors*; also that reported, with an illustration by Fritsche in Poland, and figured in Tilbury Fox's *Atlas of Skin Diseases*. There can be no doubt, in Dr. Keegan's case, as to the existence of true molluscum fibrosum, and we

think that the pendulous growth should likewise be regarded as a manifestation of that disease, and not as an example of dermatolysis. In typical cases of this latter disease, there exist no rounded fibrous tumors, the formation being merely a more or less diffuse or circumscribed hypertrophy of the integumentary structures.

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#### MEDICINAL SOAPS.

The subject of soaps (Volkmann's *Sammlung klinischer Vorträge*, No. 252, 1885) has been lately receiving the attention of UNNA, of Hamburg. A basic soap of fixed composition, with which might be incorporated various medicinal substances, was prepared, consisting of sixteen parts best ox fat, two parts olive oil, six parts 38° Beaumé soda lye, and three parts Beaumé potash lye. This combination of the alkalies had the advantage of being less apt to blister the skin when medicinal substances are incorporated with the soap. The soap so made and composed is over-fatty—that is, possesses about four per cent. excess of fat over the amount necessary for complete saponification. In color it is yellowish-white, of waxy consistence, and permanent.

Although, theoretically, Unna considers that beef fat alone is the most perfect fat for soap manufacture, an advantage seems gained by adding one proportion of olive oil to eight parts of beef fat. The objection to cocoanut oil, from which a soap can be made which produces a good lather, is, that after continued use the skin becomes harsh and dry. Neutral soaps if used habitually tend to produce roughness and harshness, the natural oiliness of the skin being too completely removed. Hence an excess of fat was found to add to the value of the soap, both for medicinal and toilet purposes.

For skins in which there is naturally a tendency to harshness and dryness, the soap was found exceedingly valuable; the skin after its use is smooth and pliable. This basic soap Unna designates over-fatty basic soap (*über fettete Grund seife*).

For thinning down the horny layer in parakeratoses and in acne, an "over-fatty marble soap," made up of one part of the basic soap and an equal quantity of very finely powdered marble, is highly spoken of. It is far superior to the pumice-stone and sand-soaps, inasmuch as it accomplishes the same purpose, and has the advantage of leaving the surface normally unctuous and smooth. Several other combinations are advised for special purposes. Thus "over-fatty ichthyol soap" is especially valuable in rosacea. If the disease is mild in character, washing the parts with this soap and hot water two or three times daily is commended. If the soap lather is allowed to dry on, as is advisable in severe cases, a stronger effect is produced. The washing with this soap does not necessarily prevent other measures being carried out at the same time, using the soap during the day and pastes or salves, if desirable, at night. "Over-fatty salicylic acid soap," and other medicinal incorporations, are mentioned, and advised for the disorders for which the drugs are in other forms, as salves and lotions, often employed.

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#### TOPICAL APPLICATIONS IN DISEASES OF THE SKIN.

The past several years have shown a decided advance in the methods of external treatment of cutaneous diseases, and in a recent paper by BROOKE

(*Medical Chronicle*, Manchester, Oct. 1885) these various methods are mentioned, and several new plans, which the author had found valuable, added. In regard to the application of an ointment the uselessness of simply rubbing it over the surface compared to the correct method of application by spreading upon muslin and binding down to the parts is casually referred to. Hebra insisted upon this latter method of applying almost all ointments, and although its greater efficacy is admitted, it is only exceptionally practised.

The introduction by Unna of the medicated salve "mulls," and the gutta-percha plaster, was an important innovation. The former are prepared, as is now tolerably well known, by incorporating the medicinal substances with a firm basis, usually of benzoated lard and suet; this is spread upon mull, and is kept ready for application. The gutta-percha plaster, made of gutta-percha faced with some adhesive substance containing the desired medicament, the whole of which is backed with muslin, is more elegant than the salve mull, but is, unfortunately, expensive.

The author has devised another method, a modification of the above, but much more simple and less costly. The medicament is made up with a stiff basis in the form of a stick of cosmetic, the basis composed of wax, cocoa butter and oil. This when rubbed on the skin leaves a thin coating which is scarcely perceptible, and yet satisfactory. If applied to covered parts, a piece of impermeable adhesive plaster sufficiently large to overlap the ointment, may be placed over it, so as to protect the clothing, and keep the application from shifting. The author has found that this method in the treatment of psoriasis is better than that by traumaticin as advised by Auspitz.

As an impermeable back for hard ointments Brooke finds a gutta-percha tissue affixed to a thin, smooth piece of paper which had been permeated by gum-water, tolerably satisfactory. As it is not very pliable, bandaging is necessary when applied about joints.

Another useful basis consists of a mixture of equal parts of almond oil and thick gum-water. When rubbed into the skin it soon dries and forms a thin coating. In eczema, this oil-gum with 15 to 20 per cent. of salicylic acid is often serviceable. The same combination is valuable also, as an auxiliary, in lupus. The oil-gum, with 10 per cent. of pyrogallie acid, applied to patches of psoriasis, acts favorably. The deficient adhesiveness of the gelatine preparation may, Brooke suggests, be overcome by the addition of gum. The compound tincture of benzoin, as suggested by Taylor, of New York, is also a valuable means of applying medicaments to the skin. The application of tar, in the form of a tincture, a well-known method, forms a smooth protective covering; and may, in fact, be used as a vehicle for other drugs.

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#### CHLORIDE OF CALCIUM IN SCROFULODERMA.

In addition to other affections of a scrofulous nature, DR. R. W. CRIGHTON, of Edinburgh (*Practitioner*, September, 1885), has had good effects from the administration of calcium chloride, in enlargement and suppuration of the cervical lymphatic glands, and in cases in which the overlying skin has become ulcerated and shares in the destructive process (scrofuloderma). To children the dose varies from one to several grains, according to the age; to adults the dose is much larger, twelve to fifteen grains. A preference is ex-



pressed for the crystallized chloride of calcium, as the anhydrous salt has an unpleasant taste and forms a turbid solution. It is best given in milk, and after meals.

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#### TREATMENT OF RINGWORM OF THE SCALP.

DR. A. J. HARRISON (*Brit. Med. Journal*, Sept. 5, 1885), in a paper read before the British Medical Association, advises the treatment of ringworm patches of the scalp with an alkaline solution, preferably liquor potassæ, containing in every ounce a half drachm of potassium iodide, subsequently applying an aqueous solution of corrosive sublimate, three grains to the ounce. The liquor potassæ softens and dissolves the hairs, and carries the potassium iodide to the root, and also facilitates thorough penetration of the corrosive sublimate solution. Reaction takes place within the follicle, biniodide of mercury—a powerful parasiticide—is formed, which proves destructive to the fungus. The hair should be clipped short before beginning treatment. The method is claimed to overcome the chief obstacle to successful treatment of ringworm of the scalp, namely, the difficulty of bringing the parasiticide in contact with the fungus in the hairs and hair-follicles.

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### MIDWIFERY.

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UNDER THE CHARGE OF

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#### ERYSIPELAS OF THE FACE IN THE HUSBAND, WITH RECOVERY ; PUERPERAL SEPTICÆMIA IN THE WIFE, FOLLOWED BY DEATH.

The coincidence of erysipelas and of what was designated formerly under the generic name of puerperal fever has been often observed in hospital and private practice. Without wishing to prejudge the question of complete identity, the following observation by DR. AMBROISE GUICHARD (*Arch. de Tocologie*, July, 1885, p. 621) seems to demonstrate the contagiousness of the husband's erysipelas to the wife, who had been but lately confined and was seized three days after delivery with puerperal septicæmia, or what might be called "uterine erysipelas."

Mrs. D., aged twenty-seven, wife of a railway stoker, was delivered for the fourth time on Jan. 17, 1885; the three preceding confinements had been perfectly normal. The fourth labor was normal and very rapid, the child being born before the arrival of the midwife, who had only to extract the placenta, which was lying in the vagina. The patient was left in charge of a relative, who allowed her to remain in the soiled linen and did not wash or otherwise clean her. On the 20th of January the patient was taken with shivering, chattering of the teeth, fever, diarrhœa, tenderness of the abdomen, suppression of the lochia, and was half delirious. Things grew rapidly worse in spite of anti-septic injections, quinine, and other remedies; the temperature ran high,



peritonitis became general accompanied by tympanites, and the patient died on the 30th of January. On the occasion of Dr. Guichard's first visit on the 23d of January, attention was called to the condition of the husband: he was suffering from facial erysipelas. On making inquiries, it was found that on the 15th of January he had been seized with shivering and fever; the same evening erysipelas began on the nose and then spread to the forehead, scalp, and posterior part of the neck. The attack ran a mild course, and by the 30th of January the erysipelas was quite cured. Three important dates may now be noticed:

*Jan. 15, 1885.* Onset of facial erysipelas in the husband.

*17th.* Delivery of the wife.

*20th.* Onset of puerperal mischief.

The husband, though mostly absent at work, returned home every day; in spite of his erysipelas he continued at work till January 23d, and continued as usual to share the same bed with his wife: it was only after the visit on the 23d that he began to occupy a separate bed, and by this time his wife was already seriously ill. The midwife cannot be suspected of conveying infection, for she had not been in any way exposed, and had arrived too late at the labor to undertake any manipulative interference. An investigation into the antecedent history of the wife proved that she had not been exposed to any other sources of infection; her child remained well, and, though of necessity living in the same room, suffered no trouble in connection with the umbilical wound.

The following deductions seem warrantable:

(1) The husband communicated the infectious germ to his wife; the portal of infection was through the external or internal genital organs.

(2) This single case does not allow of our determining the nature of the troubles of lying-in women described under the name of puerperal fever; but in the present case one common infectious agent or microbe must have been the common starting-point of facial erysipelas in the man and septicæmia of the internal genital organs in the woman.

(3) As a prophylactic, the physician ought to remove every case of erysipelas from the neighborhood of lying-in women, and therefore to forbid all cohabitation before, and for some time after delivery with the husband, if the latter is suffering from erysipelas.

Strict antiseptic precautions ought to be carried out in the surroundings of the woman before, during, and after confinement. The accoucheur and the nurses should not forget that they may be the direct medium of contagion, and should, in consequence, neglect no antiseptic precaution.

A lying-in woman should never be placed in a room previously inhabited by a case of erysipelas, until the chamber has been completely disinfected.

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#### BROW PRESENTATIONS.

DR. E. BLANC, in the *Arch. de Tocologie* (July, 1885, p. 614), analyzes and studies an interesting work which has just been carried out by M. DEVARs, on delivery in brow presentations; it is proposed in a rapid analysis to call attention to the facts, either new or original, which have been brought forward in this investigation. M. Devars divides his work into five parts, viz., the history of the subject, the signs and frequency of these presentations,

their mechanism and etiology, their diagnosis, and, lastly, the therapeutical indications to be derived. The historical part it is not necessary to dwell upon, nor upon the signs of these presentations furnished by the anatomical peculiarities of the frontal and neighboring regions; attention may be turned at once to the question of frequency. Cases of brow presentation do not seem to be very common. Heinrichius, in the Maternity of Elsingfors, found only 12 instances out of 5000 confinements; Mangiagalli, during a period of five years, collected 64 cases, 17 of which occurred at the Maternity of Milan, but does not say out of what total of labors. Devars, examining the records of the Clinique d'Accouchements at Lyons for the last five years, found 5 cases in 1402 labors.

By what mechanism is the expulsion of the head effected in these cases? It may be described briefly as follows: The superior maxillary bone corresponds to the occiput in vertex presentations, to the chin in those of the face; whatever the position of this bone at the onset of labor, the expulsive forces will always tend to bring it beneath the symphysis pubis, which is to furnish it with a *point d'appui*, while the longitudinal diameters of the head, the naso-bregmatic, the naso-sagittal, and naso-occipital clear in succession the pelvic outlet and the vulva. After the occiput has become freed from the posterior commissure, the mouth and chin will appear in front of the pubis. The deformity of the head in these presentations is considerable; the head compressed in its suboccipito-mental diameter assumes the form of a triangle, the base of which, viz., the occipito-frontal diameter may measure 13, 14, or even 15 centimetres (5.1, 5.5, or 5.9 inches). Such a lengthening of the longitudinal diameters of the head would appear a source of danger to the vulva and perineum, but it is to be noted that at this stage the face rests by the superior maxillary bone or by the nose against the back of the symphysis, while the forehead is free in the vulvar orifice; a naso-occipital diameter shorter than the occipito-frontal clears the vulva, and it is only after the occiput is disengaged from the posterior commissure that the chin appears below the pubic arch. Too great a distention of the soft parts is thus avoided. Devars admits an equal likelihood of these presentations becoming transformed into those of the vertex or face; Mangiagalli objects to this; he compares the foetal head to a triangle having its apex at the forehead and its base formed by the occipito-mental diameter; but one of the sides, viz., the fronto-mental, is the shorter; instead, then, of the base of the triangle engaging parallel to the pelvic inlet, it will be inclined at an angle, the forehead will descend lower in the pelvic cavity than the occiput, and the engagement of the head in the form of a brow presentation is thus rendered possible: clearly, if this presentation undergoes a transformation, the face should succeed to the brow. Belluzi never saw a brow presentation end in a vertex presentation. Which of these views is correct? Probably a distinction should be made according as the head is slightly engaged at the inlet, or has descended well into the cavity of the pelvis. In the first case the position of the head may change, producing readily the presentation of either face or occiput; in the second, the chin being lower than the occiput, a change to the occipital presentation is less likely.

Among the causes which produce brow presentations may be quoted the resistance of the cervix, uterine obliquity, hydrocephalus, thoracic or ab-

dominal dropsy, twists of the cord round the neck of the fœtus, small size of the child, and, lastly, pelvic contractions. Observations made by ourselves experimentally, as well as the opinion of numerous authorities, confirm the belief that contractions of the pelvis play an important part in producing the presentations now under consideration.

The diagnosis is not difficult, as a rule; the prognosis is serious for both mother and child, but especially for the latter. M. Devars puts the infant mortality at nearly fifty per cent., while other authors make it only twenty or twenty-four in the hundred. In 9 cases recorded by M. Devars, delivery occurred spontaneously in 3, and in 6 forceps were used; in the 3 cases two mothers and two children died, while in the 6 cases only one infant succumbed.

Regarding treatment, it is to be noted that in most cases operative interference is called for; among the modes of procedure most approved are change of presentation, effected by manual manipulation, version, the use of forceps and of the lever, and, finally, as a last resource, craniotomy. While the head is still at the pelvic inlet, change of presentation is particularly applicable; indeed, it may be attempted even when the head is already in the pelvic cavity, though in this latter case we should endeavor, if possible, to bring down the chin.

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#### BINIODIDE OF MERCURY AS A DISINFECTANT IN OBSTETRICS.

This subject was brought forward by DR. E. P. BERNARDY, at a meeting of the Obstetrical Society of Philadelphia, on June 4th (*Medical News*, Aug. 8, 1885).

In three cases, the lochia had become offensive after delivery. The uterus was washed out with biniodide, and within twenty-four hours the offensive odor ceased, and from that time the coexisting symptoms began to improve. The method he had pursued in making the solution was: Take three grains and a half of biniodide of mercury, well triturated in a mortar, and rubbed with one quart of boiling water, slowly added, giving a solution of 1 to 4390. This solution he had found non-irritating, but equally efficacious in its action to bichloride 1 in 2000. Indeed, in one case in which the bichloride had been first employed, the result appeared to be decidedly in favor of the biniodide. Moreover, he points out that, owing to the smaller quantity of mercury in the latter, the risk of salivation is diminished.

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#### CASE OF "MISSED LABOR" WITH CÆSAREAN SECTION.

DR. STANLEY P. WARREN reports (*American Journal of Obstetrics*, July, 1885) the following instructive case: Mrs. McD., aged thirty-two, married, had one child thirteen years ago, but had not been pregnant since. Last menstruated in January, 1884; usual symptoms of early pregnancy followed. At end of April had symptoms of miscarriage—pain and hemorrhage—for some days, followed by discharge from vagina "like thick molasses."

May 2. Temperature and pulse raised. Cervix enlarged, tender, and discharging a thick bloody fluid in small quantity; abdomen tympanitic, somewhat swollen and sensitive. In right iliac fossa a tumor was apparent to sight and touch, about as large as closed fist, pear-shaped. The above men-



tioned signs of metroperitonitis in a few days culminated in an attack of general peritonitis, from which, however, the patient recovered and was convalescent in fifteen days.

*July 5.* Iliac tumor had disappeared, but another had succeeded it in median suprapubic region. It was unquestionably the pregnant womb, for foetal circulation was distinct, and she had felt movements for several days.

*October 29.* Term. Signs of labor set in; pain in back, and especially in right side of womb. The pains, apparently caused by excessively active foetal movements, were not rhythmical, and did not present the expulsive character of true labor-pains. Per vaginam, cervix long, external os open, inner os too high to reach. Externally, uterus prominent, as though there was not much liquor amnii. Child placed almost exactly transverse with head to right. Attempt at external version failed to effect any change in position. No further progress made.

*November 7.* Child was found to be dead.

*25th.* Peculiar pains like those a month before.

*December 19.* Still no progress. A discharge of blood occurred, and "some pieces of flesh" were passed a day or two ago. Dr. Warren remarks (as it was afterwards proven that the membranes were unruptured), this "show" may possibly have been from slight detachment of the placenta. Uterus lower down in abdomen. External os dilated and flaccid, resembling mouth of a bell. Rest of cervix is a long, rigid tube. Several times in next day or two middle finger, up to second joint, was pushed through it, and just into uterine cavity. Some part of foetus was felt there, and conjectured to be the breech. Cervix easily drawn down to vulva, and after each examination distinctly felt to contract. Hot vaginal injections and quinine given, but failed to provoke uterine action. Subsequently inner os closed so tightly that it was impossible to push anything through it, and there was not the slightest uterine action. Nocturnal pain through abdomen and side of uterus; dorsal decubitus only; chilly; pulse 110-120; temperature 101°-102°; intestines torpid. Induction of labor decided upon.

*29th.* Found impossible to pass sponge-tent through closed inner os. It was left in cervix for twelve hours, but without making any perceptible impression upon it.

*30th.* Under full anæsthesia, with chloroform, it was found possible to pass finger slowly through long cervix into cavity, where same presenting part of foetus was felt as before. Canal closed as tightly as ever on withdrawing finger. Attempts at forcible dilatation were then made successively with small uterine dressing forceps, with placental forceps, and with a cranioclast, producing, however, but little effect on the rubber-like band of the internal os. The blades were separated as widely as possible while being drawn out of the stricture. During this proceeding the patient lost about one quart of blood, and a state of profound shock ensued. On examination, a rent was discovered posteriorly above the neck in Bandl's zone, and the cervix was found to be torn nearly away from the body.

After the patient had been partially rallied, abdominal section was performed. About one pint ascitic fluid on left side. Peritoneum found to be so closely adherent to uterus that hysterectomy was rendered impossible, and the adhesions were with difficulty separated far enough to incise the uterus. Uterine incision was made in middle line, four inches in extent, directly



into cavity. Lower edge of placenta was wounded, but there was no hemorrhage. Cut edges of womb were not over one-quarter of an inch thick, and did not bleed. The cavity was full of thick, grumous débris. Foetus still occupied same position as in October. It weighed eight and a half pounds, and was extracted with some difficulty. During the process a further considerable laceration was occasioned at an angle to the incision on right side. Stricture of inner os and the rent were verified from within. Uterus was sutured with catgut and the abdominal section closed. After delivery, and, indeed, during it, there was not the slightest contraction of uterus, and its tissues were evidently far advanced in atrophy. Patient died twenty-eight hours after operation. No autopsy could be obtained.

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#### PULMONARY THROMBOSIS IN PUERPERA.

DR. PETER YOUNG contributes to the *Edinburgh Medical Journal*, July, 1885, p. 41, an interesting paper on this subject. The main features of the case on which it is founded are shortly as follows: A widow, left with four children, the eldest seventeen years old, was, seven years after her husband's death, seduced under promise of marriage, but at the time of her confinement the engagement remained unfulfilled, and, moreover, the paternity of the child was denied by her former admirer—a circumstance which had a very depressing effect upon the widow, who kept all her sorrow to herself. Labor was natural. Subsequently, though the pulse remained somewhat frequent and the patient wore a listless, apathetic expression, no untoward symptoms supervened. On the eighth day after delivery she was able to dress and to sit up for three or four hours. She retired to bed that evening apparently quite well. Next morning she was found dead in bed, with features calm and placid, eyelids open and pupils dilated, limb semiflexed, and body resting on left side in the attitude of natural sleep.

In the post-mortem examination the peritoneum and uterus were found to be healthy, fundus on level with brim of pelvis, uterine and iliac veins, as well as vena cava, also healthy, but containing a good deal of dark fluid blood. Lungs pale and mottled with dark pigment, but otherwise healthy. Heart flaccid, and ventricles filled with dark fluid blood; muscular substance very friable, pale, soft, and distinctly fatty, especially that of right ventricle, which is thinner than natural. Pulmonary artery filled with soft, dark-red clot, smooth and non-adherent, so that it could be easily drawn out of the vessel.

This case Dr. Young looks upon as one of those exceptionally rare instances of primary coagulation of the blood—in other words, of true thrombosis of the pulmonary arteries. In this particular case there were three main factors favoring the coagulation of the blood in that situation: (1) The fatty state of the cardiac muscle. (2) The depressed mental condition of the patient, which tended to lower the heart's action. (3) The condition of the blood, clots being more apt to form when from any cause the flow is retarded than when the blood is in a healthy condition.

Judging from the history of the case, he is inclined to think that pulmonary thrombosis has different clinical features from those of pulmonary embolism. In pulmonary thrombosis we may have no indication of impending danger

except in the condition of the pulse. The patient makes no complaint except probably of weakness, and death may occur during sleep, without a pang, owing to the gradual stoppage of the heart's action. Unfortunately, the patient was so averse to be disturbed that no examination was made of the heart during life.

With regard to treatment, in addition to keeping the patient quiet, and strengthening the heart's action by the administration of digitalis and carbonate of ammonium, it is of primary importance not to allow the patient to lie down until all signs of dyspnoea have disappeared, or the heart's action is good. The assumption of the erect or sitting posture in these cases is very important, as the muscles of respiration then act to much greater advantage, and the free expansion of the lungs, by facilitating the flow of blood in the pulmonary vessels, greatly assists the laboring heart to perform its work. In the recumbent posture, on the other hand, if there be any clots, whether primary or secondary, in the pulmonary arteries, the heart will experience more difficulty in driving on the blood, and there will, consequently, be a greater tendency for it to come to a standstill. In many of the cases of persons found unexpectedly dead in bed, doubtless, death has occurred in the manner indicated, an event which might have been averted if the sitting posture were adopted during sleep, until by the administration of appropriate remedies the heart's action is strengthened and better fitted to perform its functions.

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#### RUPTURE OF THE PERINEUM.

DR. FRANK H. HAMILTON, at a late meeting of the New York County Medical Association (*Medical News*, July 4, 1885), made a few practical remarks on this subject.

Rupture of the perineum, he said, may be due to one or more of several causes. (1) The perineum itself unusually deep in antero-posterior direction, or thinner, more delicate in structure, and less elastic than natural. (2) Deficient curve in sacrum and coccyx. (3) Large unyielding head. (4) Too rapid descent of presenting part under the influence of strong uterine contractions. (5) The use of forceps, especially when retained in position until the head has passed the vulva, or when, by their use, the labor has been so much expedited that the perineum is "taken by surprise," or the head of the child is brought down to the lower strait before it has been properly moulded.

The practice of "supporting the perineum" Dr. Hamilton looks upon as useless, except where pressure is made with the purpose of carrying the head forward toward the pubes in those rare cases in which, from the lack of curve in the sacrum and coccyx, or from any other cause, the vertex fails to take that direction.

He is entirely opposed to the immediate or primary operation for ruptured perineum on the following grounds: (1) The rent under judicious management frequently becomes partially and sufficiently closed spontaneously, so that in some cases operation is unnecessary. (2) The extent of the lesion immediately after delivery often cannot be accurately determined. (3) The already prostrated condition of the patient and the contused state of the tissues, render any operation at such a time undesirable. (4) The liability to failure after operations performed under such unfavorable circumstances is much greater than in secondary operations.

## TEN CASES OF PREGNANCY AND LABOR COMPLICATED WITH FIBROIDS.

In determining the coexistence of pregnancy with fibroid tumors of the uterus, DR. JAMES R. CHADWICK (*Boston Medical and Surgical Journal*, Aug. 30, 1885) attaches much importance to the following diagnostic points: (1) Unduly rapid growth of the fibroid tumor when such has been known to exist previously; and (2) an area of flat percussion extending beyond the limit of the tumor or tumors. These, in association with other more generally recognized signs of pregnancy, such as bluish discoloration of the vulva and cessation of menstruation, may greatly assist the diagnosis, especially in the early months of gestation before other more certain signs are obtainable.

In one case the patient miscarried at three and a half months. The others were delivered at term. In four of the cases inertia set in, and forceps were called into requisition. In two cases, in which the tumor (submucous) partially filled the pelvis, and the child was placed transversely, podalic version was resorted to. In one of these, owing to the size and position of the tumor, intrauterine manipulation was carried on with difficulty, and extraction of the child was accomplished by the exercise of considerable force. The placenta, situated mainly over the tumor and encroaching upon the os uteri, was removed by the hand. It was then found that the vagina was torn through transversely immediately below the posterior lip of the cervix, to which the tumor was attached. The patient developed symptoms of peritonitis on the third, and died on the fifth day after delivery. In the other the tumor plugged the os uteri immediately after delivery. Symptoms of septic poisoning supervened three days later, and death occurred on the twenty-third day. The child in this case was stillborn.

In the remaining seven cases the mothers recovered; two of these, however, after slight attacks of septicæmia. In both of these, forceps had been used, and in one of them, complicated by preëxisting kidney mischief, the child was stillborn in occipito-posterior position. The tumor in this case was also of the submucous variety.

The degree of danger, both to mother and child, undoubtedly depends greatly on the precise location of the tumor and the intrauterine manipulations rendered necessary for the completion of delivery. Submucous tumors situated low down in the uterus, so as to interfere with the delivery of the child, increases the gravity of the prognosis. Subperitoneal fibroids, especially when situated high up, are rarely attended with dangerous results.

As regards the tumors in six of the eight patients who survived, the tumor had apparently disappeared within a year. In one it remained apparently unaltered, and in the remaining case, in which two tumors coexisted, miscarriage was followed by disappearance of one and persistence of the other.

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THE INFLUENCE OF INTERMITTENT FEVER ON PREGNANCY AND ON THE FŒTUS.

BEHRMANN (*Berliner klinische Wochenschrift*, Aug. 24th–Sept. 7, 1885) points out that statistics have shown that pregnant and lying-in women enjoy a certain degree of immunity from the effects of malarial poison; but as regards the influence of that poison on the progress of parturition and labor when once it is present in the system, there is difference of opinion; *e. g.*,



some obstetricians assert its tendency to cause abortion; others deny such a tendency. Moreover, cases illustrating the influence of intermittent fever in the mother on the fœtus are very rare; Leroux, from observations in eighteen cases came to the following conclusions: (1) Since the children of women who have suffered from intermittent fever are born with hypertrophied spleens, it is probable that the fœtus may be infected by the mother. (2) Children born of mothers suffering from intermittent fever often inherit a predisposition to that disease, since soon after birth they are attacked by malarial fever, belonging to the same type as that of the mother. Other similar cases are on record.

Some observations recently made in a malarious district and published by Lvov, are of especial interest; the conclusions he has arrived at are as follows:

(1) Intermittent fever is very common during pregnancy, and occurs more frequently in the second than in the first half.

(2) Pregnancy has no influence over the length of interval between the attacks.

(3) Intermittent fever coming on during pregnancy is difficult to cure, and when recovery has taken place, relapses are very common. Severe attacks may terminate the pregnancy prematurely.

(4) Parturition takes place on the day and at the hour at which the febrile paroxysm usually sets in.

(5) During the first stage of labor, the febrile paroxysm often shows itself; running the same course as during pregnancy. During the puerperal period, also, attacks are very liable to recur, following the same type, except that the intermission is never complete.

(6) Attacks of intermittent fever during the puerperal period do not render the woman more liable to other puerperal diseases.

(7) The fœtus is affected by these malarial attacks as by any other elevations of temperature; its movements and cardiac sounds are affected in much the same way as when the mother is attacked by typhus (typhoid) fever.

(8) A prolonged and severe attack of intermittent fever may lead to the early death of the fœtus.

(9) Intermittent fever in the mother may affect the intrauterine fœtus with the same disease.

Behrmann concludes his paper by recording two cases which came under his personal observation; they are especially interesting, inasmuch as the malarial infection of the intrauterine fœtus was easily proved.

In the first case, the mother had for four months before her confinement suffered from tertian intermittent fever. Labor came on during a paroxysm and progressed favorably. The newborn child was somewhat cachectic in appearance and weighed about 2800 grms. (6 lbs. 2 oz.). During the first day nothing unusual occurred. But about 5 P.M. on the second day it suddenly began to cry, and severe convulsions set in, lasting twenty minutes, its face becoming very cyanotic. On the cessation of the convulsions a hot stage came on, lasting three hours. Pulse 160; temperature 40.5° C. (104.9° F.) On examination the splenic region was found to be sensitive, the baby crying when it was touched. The lower edge of the spleen could be felt 1½ inches below the ribs. On the third day post-partum, the child was well; on the fourth, at almost the same hour, a similar attack came on as on the second



with, if possible, even severer symptoms. On the sixth and eighth days attacks again recurred but much slighter, quinine having been administered in the interval. The child began rapidly to improve, and finally quinine entirely cured the attacks. It was evident that the child had been infected during intrauterine life, since it was nursed not by its mother, but by a robust wet-nurse; moreover, its attacks came on on similar days, and at the same hour, as those of the mother.

In the second case, the mother had suffered for three months before her confinement from quotidian fever. The child when born was quite healthy, but on the second day and at the same hour as the attacks of the mother used to set in, it became restless, cried, and became convulsed. Its spleen was found moderately enlarged. On the next three days similar attacks occurred at 3 to 3.30 P.M., which was the hour at which the maternal paroxysms came on. This case differed from the first inasmuch as no complete intermission of the symptoms took place, the temperature in the intervals varying from 39° to 32° C. (102.2° to 89.6° F.). Behrmann considers, however, that the enlarged and sensitive spleen, the regular exacerbations of the paroxysms, the malarial attacks in the mother, and the disappearance of the symptoms in the child on the use of quinine, were sufficient to establish the diagnosis that it was suffering from quotidian ague. This child also was not suckled by its mother; it was brought up on cow's milk.

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#### DOUBLE UTERUS AND VAGINA.

The following case is described by DR. V. S. KEMARSKI in the *Vratch* (*Lancet*, September 5, 1885). Patient *æt.* nineteen, had never been pregnant before. When she first came under observation labor had commenced and membranes had ruptured. On examination per vaginam a membrane, which proved to be a vaginal septum, was found rolled up into a cord. During the pains a depression could be seen externally in the abdominal wall above the umbilicus, having an oblique direction downward from right to left. On the left was another tumor, also contracting, but less resistant to the touch than the other. As labor advanced, the groove disappeared when the fundus had reached the level of the umbilicus. The appearance then was of an arch with two horns, the right being larger than the left. Slight hemorrhage occurred from the vulva as the head approached. Delivery was effected naturally, and the placenta was born about three hours after the head began to descend through the pelvic cavity. Subsequent examination showed that the attachment of the longitudinal septum commenced at a distance of  $1\frac{3}{5}$  inches from vaginal orifice on posterior vaginal wall, and at a distance of 1 inch on the anterior wall. This septum, dividing the upper two-thirds of vagina into equal portions, had been torn through during delivery. Vaginal portion of uterus was single, but traces of division could be detected on both lips. Within the cervical canal was a thin and somewhat tightly distended antero-posterior septum which appeared to extend to the fundus and to divide the uterus into two unequal cavities. The right was the larger, and admitted the sound a distance of 2 inches; the left, the smaller, a distance of  $2\frac{1}{2}$  inches. Pregnancy had occurred in the right one. The cavities appeared to be independent, one of the other.

## THE TREATMENT OF PREMATURELY BORN INFANTS.

Every one knows how great is the mortality among prematurely born infants, and what special precautions are necessary if any hope of rearing them is to be entertained. The importance of maintaining a comparatively high temperature, and the need of carefully regulating the nourishment have, together with other details of treatment, been well brought forward by other authors, but at present M. TARNIER (*Arch. de Tocologie*, Sept. 1885, p. 819) draws attention to two additional precautions, viz., the use of a "couveuse" and "gavage." The former is too well known to need description. In using it he employed a temperature between 30° and 37° Cent. (86° F., 98.6° F.), the average being about 32° Cent. (89.6° F.). It is difficult to lay down any exact rule, but, as a general guide, we may say that the more feeble the infant the higher should the temperature be maintained. Children may be kept in the "couveuse" during a period varying from a few days to six weeks. There does not seem to be any danger incurred by withdrawing them for short periods for purposes of cleanliness or of nourishment.

In practising "gavage" he uses an apparatus which is in miniature the same as that employed by Dr. Faucher for adults. It consists simply of a red caoutchouc catheter (size No. 18, Charrière), to the upper end of which is fixed a small glass cup. In employing "gavage" the child is held on the knee of the operator, the head is slightly raised, the catheter is oiled and then introduced as far as the base of the tongue, when the child, by the instinctive movements of deglutition, carries it on to the entrance of the œsophagus; it is now pushed on gently until it has traversed the whole length of the œsophagus. After the catheter has passed a distance of fifteen centimetres (nearly six inches) we may conclude it has reached the stomach; the nourishing liquid is now poured into the glass cup, and soon by its weight penetrates into the stomach, leaving the cup and the catheter empty. In withdrawing the catheter, which should be done after a few seconds, it is needful to do so rapidly, as otherwise the fluid injected follows the catheter and is rejected by regurgitation.

What nourishing fluid is best? M. Tarnier has tried asses' milk either alone or sweetened, or mixed with beef tea, but believes that human milk is preferable to any. How many times in the twenty-four hours ought "gavage" to be employed, and what amount of milk should be administered on each occasion? It is difficult to lay down any definite rules, since much must depend on the age and strength of the infant; but if required to formulate any general rule, he should say, the meals must be more numerous and the amount of milk imbibed must be diminished according as the age of the child is less, and its vital powers more feeble. Eight grammes (123.456 grains) of milk are sufficient for one "gavage" when the child is very small and born considerably before full term. When the "gavages" are in excess, a very curious phenomenon arises, the child rapidly grows in volume and weight, but this is due to a considerable œdema of the whole body. As this œdema rapidly disappears when the supply of nourishment is more limited, he thinks it must be considered as a result of hypernutrition; if the quantity be not diminished, or if it be increased, indigestion sets in, and the child succumbs to gastritis and enteritis.

The infant shown is one of twins, born on June 8th. It remained in the "couveuse" until July 20th. From June 8th to June 12th "gavage" was employed every hour with eight grammes of human milk; from June 12th to July 5th "gavage" was employed every three hours with sixteen grammes of human milk, and in the interval of two feedings milk was allowed to trickle into its mouth; after July 5th the child was able to suck, and "gavage" was discontinued. In some cases the child is too weak to be entirely suckled, and then breast-feeding and "gavage" may be combined; during the early days of "gavage" the child's body weight may decrease, but later it rises again. Two of M. Tarnier's cases were born soon after the one hundred and eightieth day of intrauterine life, and have been successfully reared; he does not altogether despair of rearing premature children, born even before the one hundred and eightieth day, thanks to "gavage" and the "couveuse."

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#### ABDOMINAL AUTOTRANSFUSION IN CASES OF POST-PARTUM CEREBRAL ANÆMIA.

Cases are occasionally met with in which the removal of large masses from the abdominal cavity (*e. g.*, hydrops amnii, twin births, large collections of peritoneal fluid) is followed by extremely alarming symptoms, not uncommonly leading to death from cerebral anæmia. It is probable that in such cases an enormous quantity of blood collects in the abdominal venous system (which we know is capable of very great dilatation), owing to the sudden diminution of the accustomed pressure, and that the disastrous results are due to the consequent anæmia of the brain. Ordinary remedies do not act powerfully enough in such an emergency.

KOPPE (*Centralbl. f. Gyn.*, Sept. 19, 1885), on meeting with a case of this description, tried a new device for restoring the normal distribution of blood, and his experiment was crowned with success. The patient was a primipara, in whom the abdomen was most unusually prominent; the skin over it was extremely stretched, and all the other signs of excessive distention were present. *Conjugata vera* about 3.2 inches. It was possible to diagnose the presence of twins. During the labor great difficulties were met with: the first child could not be delivered without perforation; the second was smaller in size, and extracted by pulling at the feet. Both placenta were expelled without much loss of blood, and the uterus contracted well. The labor appeared to be satisfactorily terminated, when suddenly the patient became pale and collapsed; no external hemorrhage had occurred, and the uterus continued well contracted as before. Rupture of the uterus and hemorrhage into the peritoneal cavity seemed out of the question at this stage. The only other supposition was that a large accumulation of blood in the abdominal veins had taken place. The patient's head was lowered and brandy administered, but without effect. On the contrary, the pallor seemed to increase, and the patient appeared beyond hope of recovery. Koppe, at this moment, resolved to try to reapply pressure to the abdominal veins, which, by the emptying of the uterus, were now under much less pressure than before. He used for this purpose a small, soft pillow, which was very firmly pressed down on the abdomen, and bound on. A beneficial change was immediately apparent; the patient regained her color; consciousness returned, and before long she was fully restored. Koppe believes that the cerebral anæmia and



pulselessness of his patient were due to a large amount of blood being removed from the general circulation and engorging the abdominal veins, and that the extra-abdominal pressure applied by the pillow made up for the loss of intra-abdominal pressure due to the birth of twins and the discharge of the two placentæ and the liquor amnii, and caused the excess of blood in the abdominal veins to reënter the general circulation.

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#### INHALATION OF OXYGEN IN PUERPERAL ECLAMPSIA.

DR. SCHMIDT relates, in the *Russkaya Meditsina* (*Lancet*, Sept. 19, 1885), a case of puerperal convulsions successfully treated by inhalation of oxygen. The patient, who, in order to prevent the convulsions, had been kept constantly under the influence of chloroform, was unconscious and in a state bordering on asphyxia; but, after a few rather deep inspirations of oxygen, she began to show signs of returning consciousness, and, after inhaling rather more than a cubic foot of the gas, consciousness was entirely restored. No further convulsions occurred, and the patient made a gradual but complete recovery.

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#### THE NEW SIGN OF PREGNANCY.

This sign, first described by Hégar, consists in a change in consistence of the lower segment of the uterus, by which it becomes very yielding and compressible, characters which make it easily distinguishable from the thick and firm cervix. This change is most distinct at the middle portion of the lower segment of the uterus, especially in the median line, the sides being much firmer and resisting.

COMPES (*Berliner klinische Wochenschrift*, Sept. 21, 1885) publishes the results of observations made to verify the above sign, and has formed a high opinion of its value for diagnosis. The examination is made in the following way: The thumb is introduced per vaginam till it reaches the portio vaginalis, and the index-finger per rectum till it gets past the sacrouterine ligaments which correspond to the level at which the cervix joins the lower uterine segment (this procedure is sometimes facilitated by previously washing out the rectum). The disengaged hand is then placed on the abdomen immediately above the symphysis, and pressed down toward the index-finger (in the rectum), which is pushed forwards and explores the cervix, lower uterine segment (in all its portions), and, lastly, the higher parts of the uterus. The examination is facilitated by drawing down the portio vaginalis with a pair of forceps.

Compes looks upon this sign as a positive one of great value, utilizable at all periods of pregnancy, even as early as the second month, when other signs are so unreliable. He never met with it except during pregnancy, and believes the increased compressibility of the lower segment of the uterus (forming, as it does, the thinnest part of that organ) to be due to an infiltrated and succulent condition consequent upon pregnancy, and that the uterine contents can be pushed into this lower uterine segment in consequence of the increased elasticity of the wall of the upper segment of the uterus. It is, moreover, an almost certain sign of pregnancy, occurring, as far as is known, in but one other condition (*retroversio uteri*), and in that it is comparatively



little developed. In only one of the cases of pregnancy which Compes examined was this sign absent. He once found it so strongly developed (a fifth month pregnancy), and so great was the laxity of the anterior uterine wall, that it was possible to take up a fold of that wall and grasp it between two fingers.

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#### RUPTURED UTERUS; RECOVERY; SUBSEQUENT PREGNANCIES.

DR. A. E. AUST LAWRENCE reports, in the *British Medical Journal*, Sept. 26, 1885, the case of a patient who had had five stillborn and one living child. Delivery in the last-mentioned case was effected by forceps rather before the full time. Owing to slight pelvic flattening, it was decided to terminate the seventh pregnancy at the eighth month. Version was performed, but again, owing to the great difficulty in delivery, the child was stillborn.

Accordingly, in the next pregnancy, it was intended to induce labor at seven and a half months, but owing to a miscalculation on the part of the patient the operation was delayed till a month later. Labor-pains then set in of their own accord after a large dose of castor oil. The right hand and cord presented by the side of the head, and were pushed up. A binder was put on. Labor-pains continued very violently for about two hours, then suddenly ceased, and the woman complained of tenderness over the whole abdomen, but only when touched; she had no symptoms of attack, or collapse or hemorrhage. The hand and cord again prolapsed; the fœtus was turned and delivery effected without difficulty, the only abnormality noticed being that, as the hand was passed into the uterus, a slight rush of blood took place. Twenty minutes later the uterus was small and firmly contracted; the finger was introduced into vagina to remove placenta, and it was then found that the placenta had escaped into the abdomen through a rent running horizontally in the anterior wall of uterus, at the junction of its lower and middle segments. It was also observed that the uterine walls were very thin. The placenta was removed through the rent. The intestines appear to have been kept out of the rent by a distended state of the bladder—a condition which was maintained subsequently. With the same object in view, the hips were raised, morphia was freely given, and the diet limited to milk and ice. The temperature rose slightly from the third to the sixth day, but recovery was complete. Patient was up on the fourteenth day. There was a hard mass of cicatricial tissue in front of the uterus and an aperture in upper part of vagina, which ran up parallel to cervix and opened into it half an inch inside the os uteri. Subsequently patient became pregnant and was delivered at end of seven and a half months of a child which lived only a few hours. She is now six months advanced in her tenth pregnancy.

Dr. Lawrence also mentions two other cases of rupture of uterus, in which the collapse and shock, ordinarily present in such a grave condition, were conspicuous by their absence.

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#### NOTES OF A CASE OF CHRONIC INVERSION OF THE UTERUS.

Under the above heading MR. D. A. DAVIES reports, in the *British Medical Journal*, October 17, 1885, the case of a woman, aged thirty-eight, 4-para, who, three days after delivery, when sitting on the night commode, felt a severe shock with the sensation of something coming away from her, and was helped back to bed, sick and faint.

She was attended by a midwife, and was not seen by a medical man for some months afterwards. Repeated but unsuccessful attempts had been made to reduce the completely inverted uterus. The patient suffered from frequent vomiting, hemorrhage, and leucorrhœa. Ultimately (the length of time which elapsed since delivery is not stated) the uterus was replaced by means of Aveling's repositor. It is said to have "corrected itself during the night" following the application of the instrument. On the following morning the cup was found to be in the uterus, and was removed. Two days after, the posterior wall (not the fundus) was found to be bulging inwards and downwards, a condition which was readily corrected by pressure with the fingers. A distinct slip accompanied the process. The patient kept her bed for a month, and in three or four months had regained her strength. Subsequently she menstruated normally and became pregnant. No incident worthy of note occurred after delivery.

The interesting point is the spontaneous return of inversion, and its site.

#### ON PREMATURE DETACHMENT OF THE PLACENTA DUE TO NEPHRITIS.

But little is known of the conditions under which the normally situated placenta becomes detached during pregnancy, though this occurrence is accompanied by so great a risk both to mother and child that it cannot but be looked upon as of great importance. Three cases have lately come under the care of WINTER (*Zeitsch. f. Geb. u. Gyn.*, xi. p. 398), and are of interest as tending to throw light on the etiology of this rare accident. As regards symptoms and treatment, these cases resemble those published by Goodell and by Brunton.

One case may be briefly given as an illustration:

"A. B., aged forty, admitted July 30, 1884, in the eighth month of her first pregnancy; has suffered for six weeks from œdema of legs, nephritic vomiting, and headache. Twelve hours ago sudden severe pains came on in the abdominal and sacral regions, accompanied by slight external hemorrhage; since then foetal movements have ceased.

"On examination the uterus was found to reach a hand breath higher than it usually does at her period of pregnancy, and to be extremely tense and overdistended; foetal parts difficult to make out; foetal movements and heart-sounds not perceptible. Contractions of the uterus could not be perceived by the observer, though periodical exacerbations of the constant bearing-down pains were felt by the patient. None of the changes characteristic of labor were present; external os patulous, cervical canal and internal os closed. Moderate degree of œdema of legs, face, abdominal walls, and hands. Urine clear, scanty, and contains much albumen; morphological elements too few for microscopical examination; numerous petechiæ on the body. Heart and lungs healthy; skin of a pale yellowish tint."

External hemorrhage increased during the course of labor, so that the vagina was plugged several times; the size and tension of the uterus were both observed to increase. When the labor had lasted ten hours, the internal os opened and the membranes were felt to be extremely tense.

The diagnosis at this stage did not seem quite clear, and, as owing to the hemorrhage an early delivery appeared desirable, turning was resorted to. On rupture of the membranes, the examining finger seemed to come in con-

tact with soft masses, very like blood-clots, which probably lay just behind the membrane.

A small fœtus already showing signs of maceration was extracted, and the delivery of the head was followed by a mass of fluid and clotted blood in a state of decomposition. The placenta was expressed half an hour later, and presented a very characteristic appearance; it was everywhere greatly flattened and thinned, with the exception of an edge (half an inch thick and running along half the circumference) which looked healthy. The flattened portion was covered with coagulated blood-clots.

This observation settled the diagnosis that the placenta had been everywhere detached with the exception of the healthy looking margin; blood had collected behind it and the membranes, had caused the increase in size and tension of the uterus, and had led to external hemorrhage. The death of the fœtus was, of course, unavoidable. The uterus contracted well after delivery. The nephritis soon disappeared like an ordinary case of nephritis due to pregnancy, the albuminaria rapidly diminished, and eleven days after delivery was gone. The œdema also began to decrease soon after the labor.

The other two cases in the main resembled the above, and indeed the symptoms of all three closely followed those recorded by Goodell and Brunton.

In the author's cases, however, anæmia and collapse were less marked. The uterus was enlarged to the size of one and a half months further advanced in pregnancy. The distention of the bag of membranes varied, owing to the different amount of blood effused. In all three the weakness of uterine contractions was very striking.

The prognosis for the fœtus was determined by the almost complete detachment, death being then inevitable. The result as regards the mother was recovery in 100 per cent. in the author's cases as compared to the average 50 per cent.; this point is worthy of notice, and opens up the question how far the treatment was the cause of the recoveries.

All accoucheurs are agreed that a rapid delivery followed by strong uterine contractions forms the best means for arresting the hemorrhage; whenever the soft parts allow of delivery, even of accouchement forcé (within moderate limits), it should be brought on even at some risk to the mother.

But the majority of cases apply for treatment when hemorrhage has set in during pregnancy or when pains caused by the hemorrhage have just begun to affect the cervix; in such cases forced delivery is out of the question; two methods of procedure are recommended:

Goodell advises early rupture of the membranes, inasmuch as the uterus thus diminished in size contracts better and closes the bleeding spot; pains, also, are more likely to set in.

Brunton and others consider that the pressure on the internal uterine surface by the liquor amnii and the limited extensibility of the uterus are most likely to arrest hemorrhage, especially when a tampon also is used, and the membranes are not to be ruptured until everything is ready for an early termination of the labor, either by interference or not. The correctness of this view is supported by the result of the author's experience.

But the chief interest of the author's three cases centre in the etiology. None of the usual causes for premature detachment—cough, vomiting, straining at stool, etc.—were present; no history of injury or congestion of the uterus was obtainable. On the other hand, in each of my cases nephritis was present.



In the first case, it was probably due to pregnancy, and associated with a hemorrhagic diathesis; in the second, the nephritis was chronic; the third was a case of typical nephritis of pregnancy, and left no doubt of the connection between nephritis and the premature detachment of the placenta. This view of etiology is, as far as is known to the author, new, though Goodell speaks of nephritis as a complication, and other authors mention symptoms which point in the same direction, such as œdema or diminished urinary secretion.

As yet, the author is not prepared to give any pathological explanation of the connection between early detachment of the placenta and nephritis which he has shown to exist.

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#### ON THE PHYSIOLOGY OF THE EXPULSION AND POST-PARTUM STAGES OF LABOR.

SCHRÖDER contributes to the *Zeitsch. f. Geb. u. Gyn.* (xi. p. 421) an instructive paper on this subject, of which the following are the main points:

At the commencement of the expulsive stage the uterus lies somewhat to the right of the middle line, and rotated on its longitudinal axis in such a way that the left round ligament is on an anterior plane to the right. The dorsum of the foetus corresponds to the left edge of the uterus, being directed to the left and forwards. The fundus reaches to the costal arch, the uterus being longer and narrower than at an earlier period of pregnancy. Even at this stage of labor, in cases where the head lies lowest in the pelvis, the breech is no longer in contact with the fundus, and the more the expulsive stage has advanced, the further they are apart. This can be proved by measuring the distance from the advancing head to the fundus, and comparing the results with the length of the foetal body (when in utero) which we know. As soon as, during the expulsive stage, the breech has left the fundus uteri, the latter can no longer exert any special pressure on the longitudinal axis of the foetus, which henceforth is forced onwards merely by the "general pressure of the uterine contents." This pressure probably diminishes gradually toward the end of labor as the contracting part of the uterus (*i. e.*, that above Bandl's ring) moves upwards, and the muscular bundles shorten (as the uterine wall gets thicker) and become less effective. The rising up of Bandl's ring is a physiological event, and the parts below it bear being stretched very well; the danger of their giving way arising in cases of unequal stretching, as when one side is stretched while the fundus is displaced toward the other.

During labor the uterus ascends to such an extent that scarcely half the child (perhaps only a third) lies in the contracting portion, and the organ would doubtless be even smaller if that part in which the placenta lies took an equal share in contracting. Under these circumstances, by the time that in a primipara the head has reached the pelvic floor, the uterus can no longer exert any material force on the child, henceforth abdominal pressure must help. That it can do so is proved in several ways; *e. g.*, by the expulsion of the child by a post-mortem development of gases in the abdomen of pregnant women who have died without being delivered.

The true view of insufficiency of expulsive force was taken by Hofmeier when he showed that in primipara the head often remained for a long time



on the pelvic floor, owing to the uterus having risen up so high that its contractions had lost all effect on the fœtus.

It is characteristic of old multiparas with flattened pelvis, that, even while the cervix is opening up, the uterus draws itself up above the child so that the latter lies almost entirely in a loose sack formed by the lower segment of the uterus and the cervix. Such a case must not be looked upon as caused by weak pains, inasmuch as the uterus has done its usual amount of work, and would have expelled the child but for the pelvic contraction.

The energetic action of the abdominal muscles is, therefore, of the highest importance for expelling the child; for it has to overcome the resistance of the floor, and almost unaided it forces the head through the vulva, and finally expels the trunk, though the vagina may in some measure come to its assistance.

The changes during the post-partum period have been described by Schultze, and lately by Ahlfeld. A diminution of intrauterine pressure is of importance, as facilitating the detachment of the placenta. The period when the latter begins is difficult to fix; the central part is first detached, blood is effused between the uterine wall and placenta, and the detachment of placenta and membranes proceeds in such a manner that in cases where the placenta was inserted at the fundus, it appears at the vulva completely inverted; the whole of the blood being contained within the inverted membranes. If one edge of the placenta is lower than the remainder, the membrane may give way first at that side, and blood appear externally; the upper edge of the placenta still adhering, and being expelled as Duncan has described.

During the post-partum period the fundus uteri remains above the navel, unless pushed down by pressure of the hand or abdomen, and it rises even somewhat higher when the placenta, after being expelled from the fundus, fills the lower segment of the uterus.

The placenta often remains below the contraction-ring for a long time, as the mechanism destined to expel it from the vagina (its own weight and the abdominal pressure) does not always accomplish its purpose.

The practical points which result are as follows:

During the expulsion period a powerful abdominal pressure is of the greatest importance, and sedatives are of use in diminishing suffering, and allowing the abdominal muscles to act. Ergot at this period is, as a rule, not called for, inasmuch as the uterus has performed its proper share of work.

The mechanism which expels the placenta from the fundus works well; while that expelling it from the lower genital canal is untrustworthy. The precaution of keeping the hand above the uterus after the birth of the child is unnecessary. When the placenta has reached the lower uterine segment it is recognized by a diminution in the size of the whole organ, and a fulness above the symphysis corresponding to the lower uterine segment. By manual pressure just above this fulness, but below the fundus, the placenta may be easily and completely expelled. If, however, it emerges in the way described by Duncan, the loss of blood is often considerable, and the pressure not so easily applied, since the upper edge may remain in the fundus.

## GYNECOLOGY.

## REMOVAL OF THE OVARIES IN THE TREATMENT OF UTERINE FIBROMYOMATA AND OF UNRESTRAINABLE MENORRHAGIA.

In 1823 James Blundell proposed, in a paper read before the Medico-Chirurgical Society of London, to remove the ovaries in cases of severe dysmenorrhœa, or of menstrual hemorrhages proceeding from an inverted uterus, when extirpation of the latter organ was contraindicated. The proposal, however, passed unnoticed and even seemed forgotten, until the year 1872, when Battey and Hégar performed removal of the ovaries for severe dysmenorrhœa. To which of these operators the credit of priority is to be conceded remains doubtful. One point is certain: numerous imitators arose in various countries, and by their excess of zeal did much to bring the operation into disrepute. DR. SIMON DUPLAY, in an able article in the *Archives Générales de Médecine*, July, 1885, draws attention to the value of the operation in cases of unrestrainable menorrhagia, and, above all, in those in which menorrhagia is symptomatic of fibromyomata of the uterus. The frequent failure of drugs in controlling these hemorrhages is well known; equally well, the want of success in any attempt to treat or hinder the growth of these uterine fibroids. In removal of the ovaries, however, both these indications are met; physiology has inseparably connected menstruation with ovulation; without ovaries menstruation cannot exist; and clinical observation teaches that, with the onset of the normal menopause, menorrhagia almost always stops, and uterine fibroids cease to enlarge or even tend to disappear. Recognizing these truths, as well as the success of oöphorectomies done under these circumstances, Duplay decided to perform Battey's operation, and below are reported two cases, the results of which were most satisfactory.

CASE I.—Uncontrollable metrorrhagia; uterine fibromyoma; castration. Elise P., aged twenty-six, single, housemaid, admitted August 12, 1879, into Hôpital Lariboisière, under M. Siredey. Hemorrhagic tendency; history of severe attacks of epistaxis, followed by fainting; slight wounds bleed severely. Menstruation at thirteen, regular, monthly, free; lasts about fourteen days; no pain. Present illness dates from May 20, 1877. On that day, the fifth day of her monthly period, severe hemorrhage set in and continued for fifteen days, then ceased completely until the return of the next monthly period, when the same process was repeated. This state of things continued up to December of the same year. Medical treatment during this period was of no avail, and on her admission in August the loss was nearly constant. Vaginal examination by M. Siredey revealed the presence of a small fibroma (the size of a mandarin orange) situated in the right side of the uterus; anæmia and cachexia were well marked. In November, 1880, all treatment having failed, while the tumor was increasing and the anæmia and cachexia had become developed to a severe degree, the ovaries were removed; the patient made a good recovery, and rapidly regained flesh and color. Between January, 1881, and August of the same year, discharges of a reddish color, accompanied by clots, appeared. These losses at first corresponded with the menstrual epoch,

but later came at irregular intervals; at no time abundant, they disappeared totally after August, 1881. About this time symptoms indicative of Bright's disease made their appearance, and, gradually increasing in severity, led to the patient's death on the 13th of October. At the autopsy the liver, spleen, and kidneys were found to have undergone amyloid degeneration; in the fundus of the uterus was a fibroma as large as a mandarin orange.

CASE II.—Menorrhagia caused by a uterine fibromyoma; castration; recovery. Marie S., aged thirty, seamstress, admitted March 7, 1883, under M. Siredey. Menstruation at fourteen, regular, monthly loss moderate, duration three days. One child born nine years ago. The patient usually enjoyed good health, but in 1880 she began to flag and lose flesh and strength, and in February, 1881, at the close of the monthly period, a severe metrorrhagia set in. This latter was checked by ergot and acids, but returned after fifteen days, and was with difficulty controlled by ergot. After this, severe hemorrhage recurred every three weeks. For some months before admission the metrorrhagia, in a varying degree, had become almost constant. While in hospital, M. Siredey recognized in the left wall of the uterus, toward the upper part, a small fibroma about the size of a nut. In May, 1884, the fibroid had undergone a considerable increase in size, and, as the anæmia and loss of blood were endangering the patient's life, operation was decided upon. Oöphorectomy was performed on June 27. The left ovary was found without difficulty, and removed; the right was seized with some trouble, tied, cut away, and its stump touched with carbolic acid. The patient made a good recovery, and rapidly gained flesh and strength; the fibroid gradually decreased in size; slight hemorrhage occurred occasionally for a short period, but was never of any importance; a free leucorrhœal discharge existed for some months, but gradually ceased; an oozing from the nipples was only of short duration, and in six months' time the health was completely restored. Questioned on the subject of sexual appetite, the patient affirmed that, since the operation, these feelings have become very marked, and are at times a source of real difficulty to her. Of the ovaries removed, the left is found to be the larger; microscopical examination shows the presence of hemorrhagic foci; the vessels are dilated, and their walls thickened; numerous cysts, springing from old Graafian follicles, are present; the connective tissue is in excess, and there is a striking atrophy of the Graafian follicles; no corpora lutea are to be seen.

M. Tissier has collected 171 cases of oöphorectomy performed for uterine fibromyoma, accompanied by severe hemorrhage. Of these, 25 died, giving a mortality of 14.6 per cent. only, a death-rate lower than that of most major surgical operations. Of the 145 cases which recovered, in 7 only did the hemorrhage return after a short interval; in 3 cases the bleeding returned, but notably less; in 21 cases slight losses of blood returned, and persisted for some weeks or months, but then finally disappeared; in 114 cases the hemorrhage ceased after the operation, once and forever. These statistics might be found even more satisfactory if we note that in two cases only one ovary was removed, and in another a considerable amount of ovarian tissue was left in the pedicle. Certainly the conclusion is justifiable that oöphorectomy causes, either immediately or in a short time, the complete cessation of all hemorrhage.



Once more reviewing these 145 cases of recovery, we find that in 9 cases only was evidence found of undiminished or increased growth of the tumor after operation, while in 66 cases the growth rapidly atrophied, and in the other 70 a complete cure was noted without giving special information regarding the condition of the fibroid. In weighing the indications and contraindications of the operation, the death-rate has to be considered, and with a percentage of 14.6, every resource of therapeutics should be first thoroughly tried. Of course, on the other hand, the dangers of exhaustion resulting from undue delay must be borne in mind. The operation is clearly not applicable to fibroid polypi or submucous fibroids, which can be attacked *per vaginam*. Castration can be thought of only in cases in which a fibroid tumor is interstitial or subperitoneal, inaccessible and incapable of being operated upon by the usual methods, either because of its volume or its situation. As regards the gravity of the operation, there is no comparison between oöphorectomy, with its percentage of 14.6, and hysterectomy, with a death-rate of about 41 per cent.; yet these two have been compared as alternatives, though, in truth, each of them has its own special indications. According to size, fibroids may be classified as (1) small—*i. e.*, not exceeding the size of an egg; (2) medium, or those rising above the pelvic brim to a level midway between the pubis and umbilicus; and (3) voluminous—*i. e.*, reaching or extending above the navel. For these last, which are sometimes cystic, hysterectomy alone is suitable. To the first two classes, oöphorectomy is applicable, at all events in the great majority of cases. It must be borne in mind that, should hemorrhage persist after removal of the ovaries, hysterectomy is still available, and in cases recorded this course has been followed with marked success. In operating for the removal of the ovaries, the abdominal method is far superior to the vaginal, the central median incision to making two lateral ones. The abdominal incision should at first measure from four to four and four-fifths inches, and should be prolonged upward without hesitation if more space is needed. Regarding the advisability of removing the Fallopian tube with the ovary, though the reporter does not by any means entirely agree with Lawson Tait as to the influence of the tubes on menstruation, yet he thinks it well to include the fimbriated extremity in the ligature, as thereby one is more certain of not leaving any ovarian tissue behind. Of course, it is needless to dwell on the absolute necessity of removing both ovaries.

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#### ON THE ANATOMY OF PAROVARIAN CYSTS.

DR. GUSTAV KILLIAN, in the *Archiv f. Gyn.*, xxvi. p. 460, after describing the anatomical and microscopical characters of five parovarian cysts removed by Prof. Hégar, compares his observations with those of other authors who have written on the subject.

The peritoneal covering of the cyst in each of the five cases was smooth in its greatest extent, though three showed remnants of adhesions. The latter are decidedly uncommon in parovarian cysts, so much so that Duplay says, "Peritoneal adhesions, though so frequent in ovarian cysts, do not occur in parovarian."

The abundant folds on the inner surface which have been noticed by others were present in all five cases, and Killian, without denying that the involuntary muscular fibres have a share in producing them, as has been



previously held, believes that they are in part due to local thickenings of the inner connective tissue layer.

As regards the relation of the Fallopian tube to the cyst, he found that in three typical cases it adhered for a distance nearly equal to its whole length, from which he infers that the tube as a whole had been stretched. In two of the three, moreover, distinct enlargement was present, indicating that the ampullary region was involved. In all three the "fimbria ovarica" was stretched, and in one the ovary itself. The uterine end of the ovary was at some distance from the wall of the cysts, a relation doubtless due to the fact that the parovarium is in connection with the end of the ovary away from the uterus. The ovaries were usually hypertrophied, probably owing to the prolonged venous hyperæmia caused by pressure of the cyst. The form of pedicle varies greatly. It may be absent, as in cases in which the cyst grows toward one or other pelvic organ (vagina, rectum, or bladder), or it may, as in the first of Killian's cases, involve the Fallopian tube and the whole of the broad ligament as far as the uterine end of the ovary.

The epithelium, which (according to its origin) should be ciliated, was by no means invariably so; some observers have convinced themselves of the presence of ciliated epithelium in their cases, others speak doubtfully of the existence of cilia. Killian himself observed several cells with a notched free border, but leaves it an open question whether it was due to cilia or not. Well-marked cylindrical epithelium was present in three out of his five cases, and he found it always associated with cubical cells. In two cases he met with a cyst lined by a single layer of tessellated epithelium, and he was able to observe its gradual passage into cubical and cylindrical cells; he concludes, from this observation, that in an encysted cavity even tessellated cells may be derived from narrow cylindrical cells. This change in shape he believes to be due to pressure exerted on the cells by the encysted fluid. In those parts of a cyst which expand most rapidly (and in most cysts this expansion is more rapid in some parts than in others) the walls usually become thinnest, and a tension is exerted on the epithelial cells lining the cavity, which become flattened owing to the tension. According to this view, the thinnest part of the cyst-wall should have the most flattened epithelium, and Killian actually made the observation that one of his cysts had a flattened epithelium over a bulging and thin portion, and a cylindrical epithelium everywhere else. Amongst the cylindrical cells he found some that had undergone mucous degeneration, and he looks upon them as analogous to the goblet cells of the intestine. Parovarian cysts may (like ovarian) be divided into papillary and glandular, but cysts are occasionally found which belong to neither category.

Of the papillary, Killian met with two examples differing in the degree of development which the papillæ had attained. The glandular form has, he believes, not been hitherto described, though Spiegelberg noticed tubular depressions of the epithelium which other observers have looked upon as folds of the inner lining of the cyst. Secondary cysts, Killian believes, may be formed by the retention of secretion in these glands, and need not always, therefore, be due to dilatation of other tubes of the parovarium. As regards the connective tissue walls of the cysts, nothing unusual was noted, except that no trace of the delicate multinucleated network described by Spiegel-

berg could be found. In two cases out of the five, smooth muscular fibres were seen on the walls. For the diagnosis of parovarian cysts, Killian relies on the following points: The Fallopian tube and ovary are in contact with the cyst, the ampullary region is stretched, and so also are the "fimbria ovarica" and the ovary; of especial importance is the fact that the uterine end of the ovary is at some distance from the cyst-wall. Perhaps the facility with which the cyst-wall can be divided into two layers may also be of value.

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#### THE MODERN TREATMENT OF UTERINE MYOMA.

MR. LAWSON TAIT, in the *British Medical Journal*, Aug. 1885, maintains (1) that removal of the uterine appendages for myoma "when properly performed" is not a fatal operation, and (2) that its results are satisfactory and permanent.

In proof of (1) he brings forward 58 cases, operated on since January, 1884, without a death, and refers to a published series of 50 up to the end of 1883, in which there were 2 deaths.

In proof of (2), that the results of the operation are satisfactory and permanent, he gives brief notes of the results in the first 50 cases operated upon by him in which recovery took place. These operations extended over a period of some years, from August, 1872, to March, 1883. The ages of the patients varied from twenty-eight to fifty-two years. The tumors for which these operations were performed varied in size from the bulk of an orange to a size extending far above the umbilicus. The results of these 50 cases may be briefly stated as follows:

(1) *Alteration in Menstruation.* In 12 cases no note is made; in 25 cases menstruation ceased completely and immediately after removal of the appendages, but 1 of these died about six months after the operation from cancer of the uterus, while in 11 menstruation ceased after a shorter or longer period. In 1 case, however, in which menstruation ceased completely and immediately after the operation, the tumor is reported as unaltered in any way, but the patient was in the enjoyment of perfectly good health. In 2 cases menstruation was not arrested; in one of these the loss was diminished, but the tumor continued to grow; and, in the other, the patient menstruated regularly, the flow being occasionally profuse, but the tumor disappeared almost entirely.

(2) *Alteration in the Tumor.* In 13 cases the tumor "entirely disappeared;" in 18 cases it is reported as having diminished in size, often very considerably; in 1 case mentioned above, in which complete cessation of menstruation followed the operation, the tumor remained unaltered; in 1, also mentioned above, the tumor continued to grow, and the patient was slowly dying from its effects; and in 1 the patient died about six months after the operation from cancer of the uterus. In the remaining cases the result as regards the tumor is not given.

Thus, in the 50 cases, the latest two and a half years ago, failure has occurred in only two instances. In one menstruation was not arrested, and the tumor has continued to grow; in the other, the patient died from cancer of the uterus, the tumor having been either cancerous from the outset and mistaken for myoma, or originally a myoma which became cancerous after the operation.

Two of the patients have been admitted to asylums since the operation; but in one the insanity was pretty evident before the removal of the uterine appendages; and in the other it showed itself almost as soon as she was out of the anæsthetic, so that the indirect effects of the operation can hardly be credited with this unsatisfactory result; it is merely the insanity which is known to occur after almost every surgical operation which is undertaken.

Of the 50 cases, 2 were attended by failure; 2 of the patients have died from other causes since the operation, 1 it has been impossible to trace recently, and there remain 45 cases of which notes have been observed up to the date of writing. These results fully justify the following conclusions published in the *AMERICAN JOURNAL OF THE MEDICAL SCIENCES* for Jan. 1882: "That, as far as its primary results are concerned, removal of the uterine appendages for the arrest of intractable uterine hemorrhage, is an operation which is as easily justified as any of the major operations of surgery;" and, "That, so far as its secondary results are yet seen, it is an operation which yields abundant encouragement for its further trial."

## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

UNDER THE CHARGE OF

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### CRIMINAL LAW AMENDMENT ACT IN GREAT BRITAIN.

Toward the close of the last session of the British Parliament, a Criminal Law Amendment Act was passed which considerably modifies the existing law in Great Britain as to the crime of rape and indecent assaults on females. Prior to 1875, carnal knowledge of a female under 10 years of age was held to be rape and felony, even although the girl had given her consent; if the female were between 10 and 12 years, and consent was given, the lesser charge of misdemeanor was preferred. In 1875 an Act was passed raising those ages to 12 and 13. By the Act of this year it is now a felony punishable with penal servitude for life, or a shorter term, to have carnal knowledge of a female under 13; while it is a misdemeanor, punishable with imprisonment not exceeding two years, to commit the offence on a female between 13 and 16, even though consent be given.

### SUDDEN DEATH SIMULATING DEATH BY POISON.

PROF. VON MOSCHKA (*Vierteljahrsschrift für gerichtliche Medicin*, N. F. Bd. xliii. S. 1-6) relates several cases of this nature. The first is that of a woman, twenty-eight years old, who, five months previously, had borne a child, and was acting as wetnurse in a house. On December 20, 1884, she commenced to complain of pain in the neighborhood of the stomach and liver. On January 1st the pain became very severe, and was accompanied by violent vomiting. This continued for fourteen hours, when death occurred.



These symptoms were such as to excite considerable suspicion of death by poison. Accordingly, a careful post-mortem examination was made. Although slight erosions with blackened edges were found in the stomach and duodenum along the crests of the folds of the mucous membrane, yet no poison was discoverable in the alimentary fluids. The hepatic vein was filled with a large clot extending to its minutest branches in the liver. The lungs were highly œdematous. The immediate cause of death was acute pulmonary œdema, which, in its turn, was due to the disturbance of the circulation consequent on the extensive thrombosis in the hepatic vein. The alterations of the alimentary mucous membrane were similarly produced. The thrombosis was perhaps of a syphilitic origin.

This case illustrates the importance of a careful examination of every part of the body in medico-legal autopsies.

The next case is likewise that of a young woman who, after complaining for a week of slight occasional pains in the abdomen, was suddenly seized in the evening with vomiting and with severe pain in the right iliac region, and died next morning in a state of collapse. The circumstances of her death pointed to the possibility of its having been due to poison. The autopsy, however, showed that it was really due to ulcerative perforation of the vermiform appendix near its origin from the colon. The alimentary canal was otherwise normal.

In the third case, which is similar to the foregoing, a man, aged thirty-four, died after a sudden illness of six hours' duration, accompanied by vomiting and abdominal pain. Here, also, there was a suspicion of poisoning; but, on examination, death was found to be caused by perforation of the appendix vermiformis.

In both cases there was a considerable degree of peritonitis.

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#### ALBUMEN IN URINE OF DEAD.

VIBERT and OGIER (*Annal. d. Hyg. publ.*, tom. xiv. pp. 65-72) report the results of the examination of twenty-eight bodies of the Morgue in Paris, in respect of the presence of albumen in the urine of dead bodies. In all, except five, they found more or less albumen, which was not to be distinguished from the albumen met with in albuminuria. From these observations, and from a few experiments, they conclude that the urine of the cadaver nearly always contains albumen, and in greater quantity the more advanced in putrefaction the body is; further, that the albumen is obtained by solution from the walls of the bladder.

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#### SEXUAL CASES.

BRAXTON HICKS (*Lancet*, Aug. 1, 1885) relates the particulars of a few sexual cases of medico-legal interest. The first is a case in which the husband sued for nullity of marriage on account of impossibility of intercourse with his wife from her inability to separate her thighs. She could stand upright, and partially bend the thighs on the abdomen. B. H., in answer to the court, stated that the condition was probably remediable—by division of the adductors. However, for another reason—continual absence of the husband since the day of marriage—the suit was not granted. In the second case the suit



for judicial separation was preferred by the wife on account of the unhealthy condition of the organs of generation before and after marriage. The husband was proved to be suffering from a perineal abscess, the sequel of gonorrhœa, contracted some years previous to his marriage, for which abscess he had undergone one or two surgical operations. Marriage took place before the parts were restored. Intercourse occurring at irregular intervals afterward, the woman acquired uterine leucorrhœa and pelvic cellulitis, which she attributed to connection with her husband in his diseased condition, and in this she was supported by the medical witnesses. Her suit was granted.

The third case was one of a suit for nullity of marriage by the husband on account of the frigidity of his wife. Without having any repugnance to her husband, she had never permitted any intercourse. The suit was granted.

The fifth case was one in which the wife became demented after the marriage night. After some weeks the excitement subsided. It appeared that the husband, aged forty, of studious habits, had had some difficulty, from want of knowledge, in attempting coitus on the wedding night. His wife had become excited and then maniacal, and he himself was considerably frightened. The wife's friends were on the point of craving divorce. After rest and tonic treatment both recovered and resumed cohabitation, and a year later the woman gave birth to a child. The seventh case was that of a doctor who was tried for manslaughter on account of his having deserted a woman in labor, whom he was called in to attend, from the husband employing abusive language toward him. Other medical assistance was obtained after a time, but the labor was a difficult one, involving turning, and the woman died of puerperal fever. The doctor was acquitted, since it could not be proved that the same result might not have followed had he remained with the patient; but it was strongly laid down by the judge that a medical man should on no account leave a woman in labor, except his life was in peril; that he should tell them to get another attendant, and should not leave till the other arrives; otherwise, should the woman suffer from want of help, he would be held responsible for it.

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#### PTOMAINES.

An important addition to our knowledge of ptomaines has been made by GRAM, working in the laboratory of Schmiedeberg (*Arch. für Exper. Patholog. u. Pharm.*, Bd. xx. S. 116-125). He calls attention to the facility with which choline, a widely spread constituent of animal and vegetable tissues, undergoes conversion into neurine (vinylbase) by the operation of simple chemical processes, without any fermentation whatever. The importance of this is apparent when it is remembered that vinylbases are among the most important of the poisonous alkaloids, described by Brieger and others as resulting from the putrefaction of animal substances. Pure choline, which is an ox-ethyl compound and easily derivable from the lecithin present in the flesh, has no, or very little, toxic effect, whereas the vinylbase, which Gram proposes should be named vinyl-choline instead of neurine, giving the name ox-ethyl-choline to choline, has a powerful poisonous and muscarine-like action. Gram has found that by simple heating of choline with lactic acid, or of the compound of choline with tartaric acid, but especially of the acidulated platinum compound, the choline is readily converted into vinyl-choline. It is, therefore,

readily intelligible how that much of the so-called ptomaines which have been discovered in putrefying animal substances may be created by the chemical processes used for their separation, instead of by the previous fermentation. It is, therefore, essential in all investigations on ptomaines to be very careful as to the chemical methods of separation employed, and to be chary of attaching importance to the presence of alkaloids with a muscarine-like action.

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#### ALKALOIDS IN OLD FLOUR.

BALLAND, a pharmacist (*Journal de Pharmacie et de Chimie*, t. xii. p. 341, Oct. 1885), states that he has discovered the presence of alkaloids in flour which has been kept in sacks for two or three years, and that he failed to find them in new flour. The alkaloids proved, he says, poisonous to sparrows. His method of ascertaining the presence of the alkaloids was too crude to be very reliable in its results. It is, however, quite possible, if not probable, that alkaloids in old, damp, fermenting flour are found just as they are in putrefying flesh; and it is likewise probable that such alkaloids are sometimes of a poisonous character.

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#### DIGITALIN.

P. LAFON (*Progrès Médical*, June 20, 1885) gives the following as a reliable and characteristic test for digitalin: Mix the digitalin with an alcoholic solution of sulphuric acid, and add a drop of a strong solution of perchloride of iron: a blue color results.

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#### ERGOT AS AN ABORTIFACIENT.

A series of letters have lately appeared in the London *Times* (*Lancet*, Sept. 5, 1885), which show that it is no uncommon experience to find that the eating of fodder containing ergot produces abortion in cattle. This, if true, is important in relation to the often disputed abortifacient action of ergot in women. No one denies the action of ergot on the uterus after uterine contractions have once begun, but few believe that it is capable of initiating such contractions in a previously quiescent and pregnant uterus. Its action in domestic animals, however, renders it highly probable that in the cases of certain women, at least, it may act as an abortifacient. It may be added that action on domestic animals, as observed by the laity, is in accordance with the results obtained from laboratory experiments.

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#### CHLOROFORM POISONING.

LLEWELLYN ELIOT (*New York Medical Record*, July 11, 1885, p. 29) gives a valuable summary of all the published cases (56) of poisoning by the swallowing of chloroform, along with a report of a case of his own, in which, however, he was enabled to effect the recovery of the patient. The poisonous dose in his case was about two ounces; in the other cases the dose varied from half a drachm to six ounces. In his case the patient had dilated pupils, cold extremities, weak pulse (70), sighing respiration, great drowsiness, intense burning in the throat and stomach, and abdomen generally. As he was called to the patient within ten minutes after the chloroform was taken, the

patient was not yet unconscious. Emetics, and afterward coffee, were given, as also sweet oil to allay the burning sensation. The patient had practically recovered within a few hours. It appears from the summary of the other cases, that the pupil is often contracted instead of being dilated, although dilatation is the more common condition. And, although many of these were unconscious and breathing stertorously, only 16 out of 56 died. The average time in which death occurred varied from 12 to 48 hours; in 1 case it was 1 hour, while in 2 cases it was 8 days. In the latter cases death was due to gastritis.

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#### RHAMNUS FRANGULA.

O. PETERSEN publishes, in the *St. Petersburg. Med. Woch. (Lancet, Oct. 10, 1885)*, an account of a case of poisoning from taking the berries of the black alder (*Rhamnus frangula*), the bark of which is now so largely used as an aperient. It appears that the person—a boy—had eaten and chewed the stones as well as the pulp; and Petersen believes the symptoms were those of poisoning by prussic acid, which is present in the stone of this fruit, as it is in that of many others. The symptoms were headache and vertigo, succeeded by unconsciousness, with severe clonic spasms, rapid small pulse, dilated pupils, and feeble respiration. The patient was restored to consciousness by cold affusions to the head, and ether, purgative enemata, and emetics completed the recovery.

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#### HYMENOPTERA.

CARLET, of Grenoble (*Lancet, Sept. 19, 1885*), states that the sting of bees, wasps, and hornets, which is supplied with poison from two glands, has in one gland an acid, and in the other an alkaline secretion. The mixture alone is poisonous, and has a slightly acid reaction. In wasps and hornets the venom is injected by means of a contractile vesicle. In bees the poison-bag is not contractile, but there exists a kind of piston for the discharge of the poison.

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### PUBLIC HEALTH.

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UNDER THE CHARGE OF

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#### INFLUENCE OF SMALLPOX HOSPITALS ON THE SURROUNDING NEIGHBORHOOD.

Foremost amongst the defences of the public health is the means of isolation of infectious disease. American and European countries have for years regarded the isolation of the infectious sick as the chief method by which the extension of infectious maladies from one person to another can be prevented.



The notification to the local authority of cases of infectious disease has been valued as a means toward this end, rather than as affording information of the operation of a cause of disease which might be checked at its onset.

For the isolation of infectious persons occurring in populous districts, the provision of special hospitals has been largely encouraged, and, until recent years, no serious doubt has been raised that this method of affording security to the many was attended by a material disadvantage. Perhaps the earliest instance of organized opposition to the existence of such institutions occurred in the year 1802, when the London Fever Hospital made its beginning in a house situated in a street. But the opposition did not result in litigation, and the institution continued in this situation for a number of years; it was not, indeed, until a smallpox hospital was opened at Hampstead, in the northern part of London, that the cry was definitely raised that injury to life and health was inflicted upon the inhabitants of this neighborhood. Later, litigation ensued, and it was proved to the satisfaction of the court that an exceptional incidence of smallpox had occurred round the hospital. Finally, the need for more thorough and scientific inquiry into the influence of smallpox hospitals led the Local Government Board to entrust one of their medical inspectors, Mr. W. H. Power, with this duty, and the hospital chosen as the subject of investigation was an institution situated at Fulham, a district in the southwest of London, and concerning which there had been grave apprehensions that it had been in past times a cause of disease to the population surrounding it. Mr. Power's investigations began at the commencement of an epidemic in 1881, which afforded him all the material necessary for his purpose. As to the result of his labors he found:

(1) There had been in each epidemic period since the hospital had been opened, in 1877, an excessive incidence of smallpox in houses in the neighborhood of the hospital, as compared with more distant houses.

(2) The percentage of houses invaded in the neighborhood of the hospital had become gradually smaller, as the distance of the houses from the hospital had increased; this gradation had been very exact and very constant.

(3) Houses upon the chief lines of human intercourse with the hospital had not suffered more than houses lying in other directions from the hospital.

(4) In point of time there has been a very marked relation between the varying use of the hospital and the manifestations of excessive smallpox in the neighborhood; this relation had not shown itself while the use of the hospital had been for convalescents only.

(5) The appearance of excessive smallpox in houses around the hospital had never been delayed until the hospital had become full or nearly full; it had been always most remarkable at the time when admissions to the hospital were beginning to increase rapidly. In the succeeding months of active operations, though the use of the hospital may have gone on increasing, the excess of smallpox in the neighborhood had habitually become less marked.

(6) On comparison of different epidemics, an almost constant ratio was observed between the amount of hospital operations and the degree of excess of smallpox in the neighborhood.

Mr. Power's observation having led him thus far, he proceeded to analyze all the circumstances of hospital administration, with a view to learning whether there could be found any relation between these circumstances and



the behavior of smallpox in the neighborhood of the hospital. The most careful analysis of the movements of residents in the hospital, or of other persons, visitors, tradespeople, and workpeople, failed to give any clew to the cause of the occurrences narrated. Finally, by an examination of meteorological conditions, he sought for those which would enable particulate matter to be disseminated; in this connection he wrote, "Familiar illustration of that conveyance of that particulate matter which I am here including in the term dissemination, is seen summer and winter in the movement of particles forming mist and fog. The chief of these are, of course, water particles, but these carry generally about with them, in an unaltered form, other matters that have been suspended in the atmosphere, and these other suspended matters, during the almost absolute stillness attending the formation of dew and hoar frost, sink earthward, and may often be recognized after their deposit."

He found that "in the days of chief distribution of smallpox around Fulham Hospital, opportunities of a remarkable kind, not for the removal, but for the quiet dissemination of matters contained in the air, and for the deposit, perhaps, of any which were particulate. While the incidence of smallpox upon houses coincident with this distribution of aërially contained matters was almost the same in all directions from the hospital as a centre, the intensity of the incidence (measured by the percentage of the houses invaded) was proportioned to the nearness of the house to the hospital. In these particular days, too, the increasing number of acute cases of smallpox being received at the hospital was charging the air of the hospital with an abundance of infection in an active state."

Another point deserving of notice was that ozone was present in the atmosphere just before, was absent during, and reappeared at the end of the period in which sufferers by the outburst of smallpox became infected. This, then, was the extent of knowledge on the subject up to the year 1882, when a royal commission made inquiry into the whole question of hospital provision for infectious disease. This commission, while accepting as not absolutely proved that smallpox was definitely distributed from the hospitals by means of the air, nevertheless based their recommendations upon the assumption that the disease was communicated in this manner, and they advised that no hospital should contain more than thirty or forty patients, and that in the construction and management of smallpox hospitals opportunities for spread of disease by personal communication and atmospheric dissemination, should be, with the utmost care, guarded against.

The facts as to distribution of disease were in 1884 examined by Drs. Tripe and Gwynn, medical officers of health of other districts in London in which smallpox hospitals were situated, with the result that the same special incidence of smallpox was found to have taken place on houses situated in proximity to the hospitals.<sup>1</sup>

A further report by Mr. Power has just been published in the report of the medical officer of the Local Government Board for the year 1884, dealing with the behavior of smallpox during that year in the district of London in which the Fulham Hospital is situated, and also considering the distribution

<sup>1</sup> Transactions of the Society of Medical Officers of Health. Session 1884-85, London, Shaw & Sons, Fetter Lane.

of smallpox in that district during the two preceding years, a period when the hospital was not in use.

It is important to note, that during the year 1884 an amount of care had been exercised by the hospital authorities to prevent the diffusion of disease by personal communication, which calls for the highest commendation. The removal of patients from their homes to the hospital had been effected in well-constructed ambulances, and no precautions were wanting to insure that there should be no omission of duty on the part of the officers attached thereto. The ambulances were disinfected with chlorine gas before they were permitted again to leave the hospital. The attendants upon the sick were not allowed as frequent leave of absence as before, and they were compelled before doing so, completely to change the whole of their clothing and to bathe in a bathroom provided for the purpose. Visitors to patients were, by a system of telephones, able to obtain information of their friends without coming to the hospital, and were only admitted within the hospital on very exceptional occasions. The number of patients received into the hospital was limited in accordance with the recommendations of the Royal Commission, and at no time were there more than thirty-five cases within its walls, and this number was only attained on three occasions. Cases of all sorts were included in this figure, for patients were retained until convalescence was fully established.

Nevertheless, the outbreak that occurred in 1881 was repeated in 1884, and again distribution of the disease was such that the houses in the neighborhood suffered directly in proportion to their proximity to the hospital, and were distributed in all directions about it, and were not especially grouped along the lines of human traffic.

Mr. Power's conclusions are :

(1) There has occurred during the epidemic prevalence of smallpox in 1884 (in the same way as before recorded for 1881), an excessive incidence of the disease on houses in the neighborhood of Fulham Hospital, as compared with more distant houses in Chelsea, Fulham and Kensington.

(2) The percentage of houses invaded in the neighborhood of the hospital has become gradually smaller as the distance of the houses from the hospital has increased.

(3) Houses upon the chief lines of human intercourse with the hospital have not suffered more than houses lying in other directions from the hospital.

(4) In point of time the excessive incidence on the neighborhood of a hospital has only been observed while the hospital has been in use for the treatment of smallpox.

(5) The appearance of excessive smallpox in the houses around the hospital was not delayed until the cases under treatment there approached the maximum attained during the year. During succeeding fortnights of active operations while use of the hospital increased, the excess of smallpox upon the neighborhood became less marked.

But Mr. Power has observed one new fact which is of vast importance as indicating the dangers which surround the existence of smallpox hospitals, viz.,

(6) The excess of smallpox on the neighborhood of the hospital was quite and specially remarkable at a time when the total admissions to the hospital had not exceeded *nine*.

Further investigation into atmospheric circumstances shows that similar

conditions existed at the time of the outbreak in 1884, that were observed to be present during the outbreak in 1881, but although these circumstances are probably sufficient to account for the dissemination of the disease-particles, Mr. Power points out that some other factor is wanting to produce disease, for the same atmospheric conditions subsequently existed during a time of hospital activity without any resulting outburst.

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### VACCINATION.

The first volume of *Arbeiten aus dem Kaiserlichen Gesundheitsamte*, in Berlin, contains the results of vaccination in the German Empire in 1882. The population of that year comprised 1,459,377 children, or 3.70 per cent. of the total population, of an age to be primarily vaccinated; but of these, 681 had previously had smallpox, and 120,232 had already been successfully vaccinated, leaving 1,338,464 children requiring operation. Of these 1,158,696 were successfully vaccinated, or 95.98 per cent.; 31,441 without result, or 2.35 per cent., and in 5773 the results were unknown. Thus of the total number, 142,507 remained unvaccinated. The reason of the increase of unsuccessful vaccinations was due to the vaccinations in the Grand Duchy of Hesse, where, owing to the introduction of animal lymph, the number of successful vaccinations decreased from 97.31 per cent. in 1881, to 63.44 per cent. in 1882. Thus, if the results in Hesse be omitted, the children in the other States who were successfully vaccinated amount to 97.48 per cent. of the total vaccinations.

It is instructive to find this statement in an official report of the German Empire following in but a few weeks the publication of conclusions of the German Commission on Vaccination, which are as follows:

*For* vaccination with humanized lymph may be mentioned the certainty of its action, the simplicity of its machinery, the inexpensive manipulation of the lymph.

*Against* it are urged the known dangers of vaccino-syphilis and erysipelas, the possibility of the conveyance of tuberculosis, and the difficulties which arise in the manipulation of the lymph.

*For* the use of animal lymph, there are urged the security against vaccino-syphilis, the advantages of a quantity of lymph produced at the same time, the possibility of manipulating lymph antiseptically, and thus a greater safeguard against erysipelas.

*Against* it, may be taken the less certainty in its results, a more complicated machinery, and the greater cost of production of lymph.

On the whole, however, it must be acknowledged that the advantages of animal lymph outweigh the disadvantages connected with its use, and that it is capable of supplying the place of humanized lymph.

In conclusion, the chief reasons for this decision may be stated as follows:

Compulsory vaccination can only be maintained if injuries to health and life through vaccination, and especially vaccino-syphilis, can be prevented.

This condition cannot be fulfilled by vaccination with humanized lymph.

Vaccination with animal lymph, which in recent times has more nearly approached the use of humanized lymph in its certainty of result, excludes all possibility of syphilis, and offers greater security than humanized lymph against other diseases, such as erysipelas. On these grounds vaccination



with animal lymph should in future take the place of vaccination with humanized lymph.—*Commission zur Erörterung der Impffrage. Denkschrift über die Northwendigkeit der allgemeinen Einführung der Impfung mit Thierlymphe.*

The report just issued of the medical officer of the Local Government Board (*Fourteenth Annual Report of the Local Government Board, 1884-85. Supplement containing the Report of the Medical Officer for 1884*) gives important evidence on these points:

1. As to risk from use of humanized lymph, DR. BUCHANAN says, "I wish you again to note the extent of the danger that accompanies vaccination under the circumstances of English vaccination practice. There is little that man, woman, or child has to do, or to have done for them, that does not contain an element of danger; but reasonable people, while endeavoring to remove all preventable risk, do not regard this risk as a reason for not doing what is proper to be done. For example, I find from the last published annual report of the Registrar General that 974 children under one year old were suffocated in a twelvemonth by bedclothes; the fact gives a reason for care in the use of bedclothes, but gives no reason for going without them. So, 55 deaths (51 being of infants under one year) were recorded in that report as from vaccination and the results of vaccination; they doubtless were, for the most part, cases of erysipelas, and their occurrence gives reason for cleanliness of lancets, for avoidance of filthy 'vaccination shields,' and generally for care in vaccination; but it assuredly gives no reason for going without vaccination. When we learn from the same report that 5 infants died in the same year from 'circumcision,' the dimensions of the danger implied in the 55 deaths by 'vaccination' may be understood. As for any remoter injury to the health of the community, attributable to vaccination as practised in England, I can find no evidence of it, statistical or other.

"As a matter of English practice, with all the opportunities for knowledge that come to me, and with an eagerness of search after facts, I cannot learn of communication of syphilis in vaccination being actually effected once in a million of vaccinations.

"I do not think it necessary to speak at length of *tubercular* diseases of children. The small increase of deaths registered as 'tabes mesenterica' has been balanced by a decrease in the deaths of children under five registered as from 'phthisis,' the death-rate from the two together having kept very closely uniform, and the changes in registered mortality of the one and the other being obviously a question of which of certain synonyms is used in medical certificates."

2. As to relative success with animal and humanized lymph.

"In England, these are identical when the operation is done directly from arm to arm, or calf to arm; thus, two operators at the Animal Vaccine Establishment, in London, produced an average of 988 vesicles for every thousand insertions of calf lymph made on infants. Now the employment of stored lymph reduces this average by some 20 or 30 per cent., whether humanized or animal lymph be used. Direct vaccination from calf to arm is only possible in large centres of population; in sparsely inhabited districts the use of stored lymph becomes a practical necessity, unless arm to arm vaccination be resorted to; hence, there is much probability that the decision of the German



Commission will tend to reduce the condition of the German people, as to protection against smallpox, to the condition of the inhabitants of the Grand Duchy of Hesse."

The Kingdom of Saxony has made arrangements for the immediate replacement of her present system by the institution of four animal-vaccine stations, the lymph from which will be supplied gratis to public vaccinators, and at a cost of fifty pfennige for each tube to private practitioners.<sup>1</sup>

How far the compulsory revaccination law of 1874 in Germany, which requires the revaccination of children at twelve years of age, and which it is proposed now to apply to children of ten years of age, may reduce the injury which has already been experienced in Hesse, time alone can show. The beneficial effect of this law is well indicated by a comparison of the death-rates from smallpox since 1874 in Berlin, Hamburg, Breslau, Munich, and Dresden, with those in London, Paris, Vienna, and St. Petersburg. The extraordinary comparative disappearance of the disease from the German cities contrasts in a marked degree with the prevalence of the disease in the other cities mentioned. Or, again, the relative conduct of the disease in Prussia, where its comparative absence is emphasized by the prevalence of smallpox in Austria, where this law does not exist, is not more remarkable than the difference of liability to smallpox of the armies of the two countries.

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#### HYDROPHOBIA.

M. PASTEUR has recently read before the Academy of Medicine in Paris a paper on a method for preventing hydrophobia after the bite.

The method consists in the preparation of a virus which can be inoculated into the subject bitten, and which can be cultivated so as to possess different degrees of virulence. The weakest strength is first injected beneath the skin of the subject operated on, and every forty-eight hours a stronger virus is injected until the most virulent fluid is reached. This is done during the incubative period, and as soon after the bite as possible, so that before the opportunity is given to the virus of the bite to produce its effects, immunity is afforded the subject.

M. Pasteur found that when a portion of the spinal cord of a dog which had died of rabies was injected beneath the dura mater of a rabbit, this animal was infected with the same disease at the end of fifteen days. The spinal cord of the rabbit contains the virus of rabies equally distributed throughout its length. A portion of the spinal cord, after removal with antiseptic precautions, is placed in a bottle containing caustic potash to keep the air dry, and it is found that the virulence gradually disappears at a rate proportionate to the lowness of the temperature. Thus, spinal cords are used which have been kept different periods of time, and a bouillon prepared from each which can be injected. M. Pasteur's experiments were necessarily confined, in the first instance, to the lower animals, and the two or three persons who, after exposure to the bites of rabid dogs, have since been successfully inoculated by him, cannot as yet be regarded as affording sufficient evidence of the value of the treatment.

Nevertheless, there is reason for hoping that a more extended experience will not lead to any less satisfactory results than those already obtained.

<sup>1</sup> Deutsche medicinische Wochenschrift; Elfter Jahrgang, No. 32.

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## TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favoring us with their communications are considered to be bound in honor to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 10th of April to the Editor,

NO. 1004 WALNUT STREET, PHILADELPHIA, U. S. A. ; or

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Liberal compensation is made for all articles used. Extra copies, in pamphlet form with cover, will be furnished to authors in lieu of compensation, *provided the request for them be written on the manuscript.*

The following works have been received for review :

A Manual of Auscultation and Percussion. Embracing the Physical Diagnosis of Diseases of the Lungs and Heart, and of Thoracic Aneurism. By AUSTIN FLINT, M.D., LL.D., Prof. of Principles and Practice of Medicine and of Clinical Medicine in Bellevue Hospital Medical College, etc. Fourth edition, thoroughly revised and enlarged. Philadelphia : Lea Brothers & Co., 1885.

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A Treatise on the Diseases of Infancy and Childhood. By J. LEWIS SMITH, M.D., Clinical Prof. of Diseases of Children in Bellevue Hospital Medical College, etc. Sixth edition, thoroughly revised. Philadelphia : Lea Brothers & Co., 1886.

Fractures and Dislocations. By T. PICKERING PICK, F.R.C.S., Surgeon to, and Lecturer on Surgery at, St. George's Hospital, etc. Philadelphia : Lea Brothers & Co.

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The Field of Limitation of the Operative Surgery of the Human Brain. By JOHN B. ROBERTS, M.D. Philadelphia : P. Blakiston, Son & Co., 1886.

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Practical Human Anatomy. By FANEUIL D. WEISSE, M.D., Prof. of Practical and Surgical Anatomy, University of the City of New York. New York : William Wood & Co., 1886.

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Lectures on Syphilis. Delivered at the Chicago College of Physicians and Surgeons. By G. FRANK LYDSTON, M.D., late Resident Surgeon at Charity Hospital, etc. Reported by WM. A. WALKER, A.M., M.D., Attending Physician to the West Side Dispensary. Chicago: A. M. Wood & Co., 1885.

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Surgical Treatment of Infants. By F. WILLARD, M.D.

Ligations for the Cure of Aneurism. By L. C. LANE, M.D., M.R.C.S.

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THE INFLUENCE OF KAIRIN,  
THALLIN, HYDROCHINON, RESORCIN, AND ANTIPYRIN,  
ON THE HEART AND BLOODVESSELS.

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CHEMISTS, for a number of years, have been industriously experimenting, hoping to find a way to produce quinine artificially. The result has been the discovery of a number of substances, some of them belonging to the phenol series of organic compounds, and possessing to an eminent degree the power of reducing hyperpyrexial temperatures.

The literature on these newly discovered antipyretics has already been enriched by a very large number of contributions, and the *Index Medicus* for 1884 and 1885 contains about ninety-four references, of which forty-two are on antipyrin, thirty-four on kairin, nine on resorcin, seven on thallin, and but two on hydrochinon. Most all of these very valuable contributions, however, treat of these remedies as antipyretics only, and of their power of reducing the temperature in fever, while very few, indeed, are devoted to their physiological action. The busy practitioner is too often obliged to remain satisfied with this, having no time to investigate for himself.

No detailed series of experiments on the influence of these remedies upon the circulatory apparatus has, so far, been published, and yet their relation to that apparatus seems all-important, for no intelligent idea of their manner of action can possibly be formed until more is

known about this; nor can the discrepancies in the results, so far as they have been recorded in the different cases, be satisfactorily explained.

It is through the agency of the bloodvessels, and the blood which circulates within them, that not only the temperature of the various organs of the body is constantly being equalized, but also that the superabundant heat, dangerous to the economy, is thrown off. As is well known, the constant or normal temperature peculiar to animals depends upon the maintenance of a proper balance between the amount of heat generated within the organism, and the amount given off to the surrounding medium through the agency of the bloodvessels of the skin, the lungs, etc.

Thus, when heat production is feeble and the temperature of the surrounding medium low, the cutaneous vessels will be found contracted, and the amount of blood which flows through them in a unit of time will, consequently, be relatively small. On the other hand, these vessels will be found dilated, and an abundant flow of blood take place through them, when heat production is increased and the temperature of the surrounding medium is high. Hence, it is evident that any interference with this important function of the circulatory apparatus must, necessarily, greatly influence the temperature of the body, and anything tending to lower the tone of the bloodvessels, or weaken the heart's action, at once deprives the organism of its most effective means for heat regulation. In the condition known as fever, the temperature peculiar to the animal, or its normal temperature, exists no longer, and in place of it we find a higher one.

It is neither possible nor, perhaps, desirable to enter here into the different theories of heat production, nor into a discussion of the gradual evolution of our present theory of the causation of fever, deeply interesting and instructive though they be from a pathological point of view; it is sufficient for our purpose to know the generally admitted fact that any abnormal increase in the temperature of the body can only be due either to an increased heat production or to a decrease in heat radiation, or to both these combined.

Kairin, thallin, hydrochinon, resorcin, and antipyrin, have all been found to reduce abnormal temperatures to a greater or less degree, in almost all febrile disorders promptly though perhaps not permanently. An experimental inquiry into the probable relations of these new antipyretics to the circulatory apparatus seemed, therefore, very desirable, and the results obtained in the following experiments will, it is hoped, quite sufficiently justify the attempt to solve the problem.

In order to work out the details of their influence on the several parts of the circulatory apparatus, we are naturally obliged to turn our attention to the cold-blooded animals. The animals used for experi-

mentation in this inquiry were the bull-frog, or *Rana pipiens*, Linn., the marsh-frog, or *Rana pallustris*, Leconte, and the slider-terrapin, or *Pseudemys rugosa*, Shaw.

For convenience of description, the experiments have been arranged into two groups.

I. Experiments on the work done by the heart when isolated from the central nervous system.

II. Experiments on the bloodvessels: (1) on the flow through the vessels of animals the brains and spinal cords of which had been destroyed; (2) on the lingual vessels of curarized frogs.

In addition to this, a short account of the influence of these drugs upon the corpuscular elements of the blood and the coagulation of blood will be given.

A detailed description of the method and apparatus used in these experiments having already been given in the number of this journal for July, 1885, a short *résumé* will here suffice for an intelligent understanding of how the results were obtained.

In the case of an experiment on the heart, this organ was isolated and left *in situ*. Canulas were then introduced into at least two of the great venous trunks leading directly into the sinus (only one in the frog), and tied as far as possible from the latter so as to keep them as well as the heart under constant and easy observation.

Two canulas were likewise introduced and tied into two of the arterial trunks coming from the ventricle. The venous or inflow canulas were connected with Mariotte's flasks containing the different feeding fluids. The various bottles were so connected by rubber tubes, that the blood from each passed through a common outlet. This outlet tube was in the same way connected with the two inflow or venous canulas leading into the sinus. When different liquids were used, they were, of course, contained in separate Mariotte's flasks, carefully adjusted, so that the pressure under which the liquid flowed out of them was the same for all. In all the experiments on the heart, the "venous pressure" indicates the height above the heart of the bottom of the air-tube of the supplying Mariotte's flasks, expressed in c.m. The supplying-tubes of these flasks had stopcocks on them, by the closing and opening of which any one flask could be used to feed the heart.

The aortic or outflow canulas were all connected with a single tube, from the distal end of which the liquid pumped by the ventricle flowed out and was collected and measured at certain definite intervals. The height of the outlet of this tube is referred to in each experiment as the arterial pressure. A mercury manometer was also connected with the outflow tube near the heart, its pen writing on the smoked paper of a revolving drum on which also a chronograph recorded seconds.

As regards the experiments on the vessels, the method employed con-



sisted in cutting out the heart and inserting canulas into the aortic trunks and one canula into the sinus. The aortic canulas were connected with Mariotte's flasks, placed at a certain height above the body of the animal, from which flasks liquid was made to flow into the arteries. This liquid, after circulating through the capillaries and veins, was drained off from the sinus into a beaker and measured at definite intervals. After this outflow had become constant, circulating fluid plus the drug was substituted for the normal circulating fluid, and the action of the drug on the vessels determined from the change which took place in the amount of the outflow in a unit of time. A decreased outflow indicated increased resistance to the flow of the fluid through the vessels, or, in other words, a constriction of them, and an increased outflow, a dilatation of them. Parallel observations were made on both frogs and terrapins according to the methods thus briefly outlined.

Observations on bloodvessels were also made according to a method recently employed by Krüger, of Berlin, and of which a short account was found in the December number of the *Therapeutic Gazette* for 1885.

In these observations, the frogs were curarized just sufficiently to abolish all voluntary and reflex movements; the animal was then placed on a glass plate armed with a cork ring, on which the tongue was fastened with needles in the usual manner, so as to expose its under surface; being kept moist with normal salt solution, it was examined under the microscope with a magnifying power of sixty diameters. After selecting from the mass of bloodvessels a certain small vein, a capillary and an arteriole, the outlines of which were the most clearly defined, outline drawings of them were made through a camera (Oberhäuser's), and careful measurements of them taken in millimetres. All observations were confined to certain short sections of the vessels thus selected. During the first ten minutes several measurements were made and carefully compared, and when it was found that they became uniform, the drug was either injected into one of the lymph-sacs, or applied in solution or in substance to the surface of the tongue, a short distance away from the point which was directly under the objective, so as not to interfere with the clearness of the field. It was found best to select small sections of clear and well-defined vessels, and confine all subsequent observations and measurements to them, in order to insure uniformity. The drug once administered, drawings of the vessels were made every five minutes, carefully measured and recorded. As a rule, these observations were not continued much over an hour, and some of them had to be discontinued even before the end of that time for reasons hereafter to be stated.

Before, however, taking up the experiments on the heart and bloodvessels, it is perhaps best to consider here the few points ascertained with regard to the action of these drugs upon the blood itself.

The blood used in these experiments to feed the heart, after being isolated, was obtained from a slaughter-house in the immediate vicinity of Washington, and collected directly from the animal; while being drawn it was defibrinated and then put into a clean, dry glass bottle and brought home. The blood was used in from one hour to an hour and a half from the time of collection. At this time, the blood usually had a sort of venous color, and only when the animal had been killed according to the Jewish rite of cutting its throat without previously stunning it by a blow upon the head, did it retain its bright scarlet color up to the time it was used.

The blood obtained in this manner was filtered through a fresh, clean cloth and mixed with an equal quantity of Ringer's salt solution. After some shaking, the mixture generally assumes a bright scarlet color, and this color it retains, as a rule, from three to four hours, or even longer. This mixture is termed normal blood or normal blood mixture in the experiments.

The drugs employed were first dissolved in Ringer's saline and then mixed with the blood; this mixture is called "poisonous blood," or, according to the drugs mixed with it, kairinized or thallinized blood, and so on.

When, in this manner, a portion of the blood was kairinized in the proportions used in the experiments (0.03-0.05 gramme of kairin to 100 c. c. of blood mixture) the mixture quickly changed color, and, within twenty minutes, it had passed from a bright scarlet to an intense dark violet, almost black color. In the case of thallin, the color of the blood changed into a dark brown chocolate tint in about the same period. Hydrochinon changes the scarlet color of normal blood into a cherry-red, the difference being slight but perceptible.

While, then, kairin, thallin, and hydrochinon more or less darken the color of normal blood, the contrary is true of resorcin, which renders it of a slightly brighter red than normal. Besides, while normal blood mixture, as has been mentioned before, after shaking for a few minutes, retains its bright scarlet color for three or four hours, resorcinized blood will remain bright red for days. A small portion of resorcinized blood put into a test-tube and set aside, was found to begin changing its color slightly only after the third day.

Antipyrin does not seem to influence the color of the blood appreciably, but rather tends to preserve the bright red color than darken it.

This peculiar influence of kairin, thallin, and hydrochinon upon the color of the blood was also noticed in the experiments on the frog's tongue, but here it, of course, required a much longer time before it became apparent.

In order to test the influence of these drugs on the process of coagulation, advantage was taken of an observation frequently made while

operating on terrapins. The abdominal cavity of these creatures, as well as the pericardial sac, usually contains a rather large quantity of fluid of an alkaline reaction which has the property of hastening coagulation, and the clot produced by adding some of this fluid to the blood is normally of the consistence of soft jelly.

In one of these experiments, 12 clean watch-crystals were used, into 10 of which 2 c. c. of this abdominal lymph were carefully measured; 0.04 gramme of each of the drugs was then weighed out, and this quantity divided, so that for each drug there were two separate watch crystals containing the drug dissolved in 2 c. c. of the lymph. The 2 remaining crystals were reserved for normal blood, one containing lymph, the other being empty. The drugs having been dissolved in the lymph by gently stirring with a glass rod, a canula was now inserted into one of the arterial trunks of the heart, and the latter allowed to pump a certain quantity of blood into each of the watch crystals, which quantity, so far as could be judged, was about equal to that of the lymph containing the drug in solution. The result was, that in all except resorcin, coagulation took place much sooner in the crystals containing the drugs than in the one which contained normal lymph only, or in the one into which pure blood had been allowed to flow. In the crystals containing kairin, thallin, hydrochinon, and antipyrin, coagulation took place in from 8 to 12 minutes; in the remainder, it took half an hour. The clots produced by kairin, thallin, and hydrochinon were of a very dark brown color, and had the consistency of firm jelly; the other three were of a bright scarlet color. The driest and firmest clot was that which contained antipyrin.

It now remained to ascertain the action of these drugs upon the corpuscular elements of the blood. For this purpose, a small drop of blood was collected upon a clean slide, as it flowed from one of the arterial canulas. This blood was, in all cases, immediately mixed with an about equal quantity of a 2 per cent. solution of the drug in Ringer's saline, covered with a glass cover, and placed under the microscope, the preparation of a specimen occupying only a few seconds. As control specimens, several normal slides were prepared, consisting only of blood and Ringer's saline, in equal proportion. In these normally prepared specimens, the red blood-corpuscles appeared as oval flattened disks, of a light brownish-red color, no nucleus being at all discernible in them. The white corpuscles, much smaller than the red ones, still showed amoeboid movements, and in some instances two were seen to fuse into one another; their contents were markedly granular, contrasting strongly with the uniform and homogeneous appearance of the red corpuscles.

In the kairinized specimen, the color of the red corpuscle was found to have entirely disappeared by the time the specimen was brought under the microscope, and a small, sharply defined, and granular nucleus

occupied the centre of the disk. The same change was found to have taken place in the thallin specimen. In the one with hydrochinon, these changes were much less marked; the color, although changed very slightly, was still that of a red blood-corpuscle, and the nucleus was never so well defined, nor so granular and round, as in the case of kairin and thallin. The resorcin specimen showed only a very faint and ill defined large and more oval nucleus within a somewhat indistinctly granular corpuscle; no change from this was noticed during half an hour's observation in any of the specimens. Antipyrin was found to have no appreciable influence upon the red corpuscles, while all the drugs promptly arrested all amoeboid movements of the white corpuscles.

These few preliminary observations show quite sufficiently that kairin, thallin, hydrochinon, and antipyrin hasten the process of the coagulation of the blood, and that kairin, thallin, and perhaps, also, hydrochinon, have a destructive influence upon the hæmoglobin of the red blood-globules; they all arrest the movements of the white corpuscles.

### I. KAIRIN.

The contributions to the literature on the physiological action of kairin, so far as I was able to find them, are few in number and limited in extent. Regarding its influence on the circulation, we hear from Queirolo (*Italia Medica*, No. 26, 1886) that under its influence the pulse-rate is lowered from six to eighteen beats per minute, according to the dose; that the arterial pressure is not appreciably affected, but is rather increased than diminished; and that its effect upon the heart is not sufficient to contraindicate its use. Girat (*Thèse de Paris*) finds a constant decrease in the frequency of the pulse and in the number of respirations; from his experiments he concludes that kairin reduces the temperature by its direct action upon the cellular tissues and by retarding the processes of combustion. De Renzi (*Rivista Klin. Terap.*, June, 1883) finds that kairin always diminishes the pulse-rate, and the sphygmograph shows an augmentation in the force of the cardiac contractions.

Regarding the influence of kairin upon the bloodvessels, Queirolo (*Arch. Ital. de Biologie*, fasc. ii. p. 224, 1884) states that he observed a notable dilatation of the peripheral bloodvessels; that in fever patients this dilatation precedes the fall in temperature for some time, and when the temperature rises again, the bloodvessels contract anew and the influence of the remedy passes off. Albertoni and Guaresch (*Centralblatt f. die ges. Therapie*, May, 1885) have arrived at the conclusions that kairin diminishes the frequency of the pulse-rate and causes a lowering in the blood-pressure, also that in small doses it increases the elimination of carbonic acid, diminishes it in large doses; the processes of combustion are retarded and the temperature is reduced by its diminishing influence on heat-production. Brouardel, Loye, and



Dujardin-Beaumetz, having observed the destructive influence kairin exerts upon the red blood-corpuscles, conclude that it reduces temperature primarily by diminishing the respiratory power of the red blood-corpuscles, destroying their hæmoglobin, and hence regard the remedy as dangerous and worthy of condemnation only.

In therapeutical literature a number of fatal cases of collapse, with intense cyanosis, have been reported, over which condition stimulants had no modifying influence. Unpleasant gastro-enteric symptoms, as vomiting and diarrhœa, also profuse sweating, are the almost invariable accompaniments of its administration in full doses. The small number of cases which have been recorded in which it had a more favorable effect seem only to increase, rather than diminish, the uncertainties of its action, and hence it is at least very doubtful that kairin will ever establish for itself a firm foothold among the remedies employed to reduce temperature in fever.

*A. The Influence of Kairin on the Heart.*

EXPERIMENT VI.—November 4, 1885. Frog 192 grms. Beef's blood and Ringer's saline (1 : 1½). Inflow canula in inferior vena cava. Outflow canulas in right and left aortæ. Venous pressure 5 c.m. Arterial pressure 15 c.m.

Time P.M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The injections of kairin and atropin into the inflow tubes were made at the time mentioned on the same line in the first column.
3.00	—	—	—	Frog in box.
30	44	30	25°	
35	44	30		
40	44	30		
45	45	29		
50	45	29		
55	45	29	25.6	
4.00	45	29		
05	45	29.5		
09	45	29.5		
13	45	29.5		
16	45	29.5	26	Injected 0.002 grm. of kairin into inflow tube; followed by almost instantaneous diastolic arrest of both auricles and ventricle; heart recovered on arterial pressure being lowered.
42	46	34		
45	47	34		
47	48	34.5		
50	48	34.5		
55	48	34.5	—	Injected 0.001 grm. of kairin; arrest transient, heart quickly and completely recovered.
5.00	46	35		
05	46	35		
10	46	34	27.2	Injected 0.002 grm. of kairin; no complete arrest, but blood ceased to come over; pressure lowered, and heart recovered.
15	46	34		
20	46	30		
25	47	32		

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The injections of kairin and atropin into the inflow tubes were made at the time mentioned on the same line in the first column.
5.26	43	30		
27	45	30		
30	47	32		
31	49	34		
33	49	34		
37	49	34	—	Injected 0.003 grm. of kairin.
38	41	17		
40	48	32		
45	48	32	—	Injected 0.003 grm. of kairin, and 0.003 grm. of atropin.
46	47	25		
47	48	32		
52	49	32		
57	49	32		
6.00	49	31	—	Injected same.
01	39	9		
02	49	30		
05	50	30		
10	49	30	—	Injected 0.003 of atropin.
11	49	30		
13	50	28		
15	50	28		
20	50	28	—	Injected 0.003 of kairin.
21	44	24		
22	50	28	—	Injected 0.003 of kairin.
23	30	12		
24	40	25		
30	50	28	—	Experiment ended.

EXPERIMENT V.—Nov. 3, 1885. Terrapin 1600 grms. Beef's blood and Ringer's saline (1 : 1½). Inflow canulas in inferior vena cava and right superior vena cava. Outflow canulas in pulmonary artery and right aorta. Venous pressure 6 c.m.. Arterial pressure 22 c.m. Kairinized blood (*a*) contains 0.04 grm. of kairin to 100 c.c. of blood. Kairinized blood (*b*) contains 0.08 : 100.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Kairinized blood was supplied to the heart at the time mentioned on the same line in the first column.
3.00	—	—	—	Terrapin in box.
40	36	27	17°	
44	36	27		
46	36	26	—	On kairinized blood ( <i>a</i> ) for one minute.
48	34	27		
50	32	33.5		
54	36	31		
57	36	30	—	On kairinized blood ( <i>a</i> ) for five minutes.
58	36	27		
59	34	30		
4.00	32	34		
01	32	36		
02	31	36		
05	25	50		
08	28	50	—	Ventricle shows increasing relaxation; its systole abnormally prolonged.
11	30	50		
13	32	54		
20	30	52		
23	30	52	—	On kairinized blood ( <i>b</i> ) for one minute.

Time P.M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Kairinized blood was supplied to the heart at the time mentioned on the same line in the first column.
4.24	25	44	16°	Heart stopped in diastole; pressure lowered.
30	23	54	—	Heart resumed work; rate still low.
35	25	50		
40	26	50		
43	26	50	—	On kairinized blood for half a minute.
44	—	—	—	No blood coming over; heart's action peristaltic; lowered arterial pressure, and drained off kairinized blood.
48	25	55	—	Heart resumed work; ventricle very large, its systole abnormally prolonged, hence increase in the amount of work done.
51	25	62		
56	26	60		
59	26	60		
5.00	26	52		
05	26	55		
10	28	55	17	
15	28	55		
25	30	52		
28	30	50	—	Injected 0.01 grm. of atropin.
30	36	40		
32	36	35	—	On kairinized blood for two minutes.
35	40	23	—	15 minutes after this observation was taken, blood ceased to come over, heart's movement peristaltic; recovery took place.
40	29	35		
44	29	45		
49	30	52		
53	33	44		
59	32	53		
6.05	35	50	—	Heart's action becoming irregular. Experiment ended.

*B. The Influence of Kairin on the Bloodvessels.*

EXPERIMENT XX.—Nov. 21, 1885. Terrapin 1205 grms. Ringer's saline. Inflow canulas in right and left aortic trunks. Outflow canulas in sinus. Venous pressure 0. Arterial pressure 16 c.m. Brain and cord destroyed. Constant pressure. Kairinized saline contains 0.005 : 100; in latter part 0 01 : 100.

Time P. M. From to	Temp. Cent.	Total outflow.	Outflow per min.	The circulating fluids were supplied to the vessels at the time mentioned on the same line in the second column.
3.20	—	—	—	Terrapin in box.
50	3.52	16°	8	
52	54	—	8	
54	56	—	8	
56	58	—	16.5	8.2
58	4.00	—	16.5	8.2
4.00	02	—	15	7.5
02	04	—	15	7.5
04	06	—	15	7.5
06	08	—	16.5	8.2
08	10	—	16.5	8.2
10	12	—	17	8.5
12	14	—	17	8.5
14	16	—	14	7
				On kairinized saline for two min.

Time P. M.		Temp.	Total	Outflow	The circulating fluids were supplied to the vessels at the time mentioned on the same line in the second column.
From	to	Cent.	outflow.	per min.	
4.16	4.18	—	18	9	
18	20	—	24	12	
20	22	—	28	14	
22	24	—	16	8	
24	26	—	15	7.5	On kairinized saline for four min.
26	28	—	10	5	
28	30	—	16	8	
30	32	—	30	15	
32	34	—	25	12.5	
34	36	—	17	8.5	
36	38	—	15	7.5	
38	40	—	16	8	On kairinized saline for four min.
40	42	—	13	6.5	
42	44	—	16	8	
44	46	18°	32	16	
46	48	—	24	12	
48	50	—	14	7	
50	52	—	13	6.5	
52	54	—	13	6.5	
54	56	—	13.5	6.7	On kairinized saline for six min.
56	58	—	14	7	
58	5.00	—	23	11.5	
5.00	02	—	27	13.5	
02	04	—	28	14	
04	06	—	18	9	
06	08	—	15	7.5	On kairinized saline for six min.
08	10	—	18	9	
10	12	—	30	15	
12	14	—	44	22	
14	16	—	40	20	
16	18	—	24	12	
18	20	—	18	9	On kairinized saline for eight min.
20	22	—	22	11	
22	24	—	30	15	
24	26	—	38	19	
26	28	—	44	22	
28	30	—	45	22.5	
30	32	—	48	24	
32	34	—	30	15	
34	36	—	24	12	
36	38	—	20	10	
38	40	—	18	9	On kairinized saline for eight min.
40	42	—	25	12.5	
42	44	—	34	17	
44	46	—	44	22	
46	48	—	50	25	
48	50	—	46	43	
50	52	18	40	20	
52	54	19	33	16.5	
54	56	—	28	14	
56	58	—	26	13	
58	6.00	—	26	13	Experiment ended.



EXPERIMENT LX.—January 8, 1885. Frog 104 grms. Curarized. Tongue under microscope magnified 60 diameters. Measurement of vessels made from camera drawings, stated in  $\mu$ .

Time P. M.	Art.	Calibre of Cap.	Veins.	Remarks.
3.30	4.6	1.0	6.4	
35	4.6	1.0	6.6	Applied 5 drops of 2 per cent. solution of kairin to surface of tongue.
39	5.4	1.8	10.6	
42	5.8	2.2	13.6	
46	6.2	2.8	14.2	
50	6.6	2.6	14.6	Washed away kairin with normal salt solution.
53	6.4	2.0	14.8	
58	6.2	2.0	15.2	
4.05	6.0	2.0	14.2	
10	6.0	1.5	14.6	
15	5.8	1.2	14.6	
20	5.4	1.0	13.4	
25	5.2	1.0	12.8	
30	5.0	1.0	11.2	
35	5.0	1.0	10.8	
40	4.8	1.0	10.2	
45	4.6	1.0	10.2	Circulation still very brisk in all the vessels. Experiment ended.

Experiment VI. shows that kairin, in comparatively small doses, lowers the rate of the heart and the work done; in larger doses it causes diastolic arrest of both auricles and ventricle; atropin, although seemingly retarding this result, is not entirely able to prevent its occurrence.

Experiment V. shows that kairin, in small doses, lowers the rate of the heart but increases the work done; larger doses decrease both rate and the amount of work done; still larger doses cause diastolic arrest of the whole organ; after atropinizing the heart, kairin seems to increase the rate of the heart in small doses, at the same time decreasing the work done; atropin considerably antagonizes the action of kairin upon the rate, and the work done in the case of the terrapin.

A strong solution of kairin injected into the substance of the ventricle causes immediate systolic arrest of the heart of the frog and terrapin.

Experiment XX. shows a slight initial decrease in the amount of outflow during the first few observations, denoting a certain degree of contraction, which rapidly gives way to a dilatation of the arterioles and capillaries. This is a constant occurrence in all the experiments made with regard to this point. The temporary contraction is entirely wanting in the subsequent observations, when dilatation is produced directly after the admission of kairinized saline into the vessels.

In the beginning of this experiment on the vessels, the great veins adjoining the sinus could be seen contracting very regularly; their contractions diminished in frequency after the first few observations with kairinized saline, and ceased altogether while the third observation was taken. The sinus kept on contracting all through the experiment, but

while under normal saline the contractions numbered thirty-two per minute in the beginning, they numbered only four per minute at the close.

Experiment XII. on the frog's tongue, shows that kairin promptly causes a very considerable dilatation of the veins and capillaries, which dilatation exceeds that of the arterioles; it shows also that the capillaries and arterioles recover their normal calibre long before the veins do, a point of some importance.

Four experiments were made with kairin on the frog's tongue, from which this is selected as typical, and as showing all the principal points. When kairin was injected into one of the lymph-sacs in doses of 0.03 gramme, the veins and capillaries became promptly dilated; the arterioles, on the contrary, showed in three cases out of four a slight initial contraction preceding dilatation, and in two cases contraction following dilatation. In no case, however, whether kairin was injected or applied externally in solution, did the arteries show the same prompt and extensive dilatation as did the veins; the veins never returned to their normal calibre as quickly as the arteries and capillaries. When kairin was applied to the tongue in the form of a saturated solution, or in crystals, the tissues were destroyed; the veins, capillaries, and arterioles contracted, and shortly after that they disappeared altogether, and in their places appeared narrow chains of fibrous tissue. Toward the end of an experiment, in which the circulation had become sluggish, and kairin had been applied pretty freely, the veins and their contents had assumed an intense dark violet hue. The arteries and capillaries had remained free from this, apparently indicating a certain affinity of kairin for veins and venous blood. To the naked eye, the tongue looked as if the vessels had been traced out in violet ink.

On several occasions a distinct acceleration of the blood flow in the arterioles was noticed as following the injection of kairin into one of the lymph-sacs; the flow in the veins was slowed.

The conclusions which we may draw from this and other experiments on the frog's tongue with kairin are: (1) that it produces dilatation of the capillaries and veins, which dilatation much exceeds that of the arterioles, which latter is sometimes preceded, sometimes followed, by an abnormal contraction; (2) that it causes a slight acceleration in the current in the arterioles and a slowing of the flow in the small veins.

All the experiments made with kairin on the heart (nine in number), show the great weakening effect it exerts upon the contracting power of the cardiac muscle. In some cases in which this organ happened to be in unusually good working order, and low venous as well as arterial pressure was used, a very slight but transient increase in the rate, and even in the force of its contraction was noticed when the dose was not too large; but this was always quickly followed by signs of general weakening. The entire organ, then, becomes much enlarged, occupying

from twice to thrice its normal volume, its contractions become peristaltic, incomplete, and sluggish; the auricles keep well filled with blood, never emptying themselves completely. As a rule, the auricles are much sooner affected and recover much later than the ventricle. Under these circumstances the rate of the heart is much decreased, the amount of work done is sometimes increased, owing to the relaxed condition of the ventricle, but more often decreased, and, finally, diastolic arrest ensues. The heart presents the color of kairinized blood, which, however, again disappears, but, after repeated kairinization, it becomes permanent—in other words, the color of the blood has become the color of the muscular substance of the heart. From this condition the heart was never found to recover: the organ seems as if gelatinized, moves *in toto*, shrinks, and contracts little by little, responds to neither mechanical nor electrical stimulation, and is to all appearances dead. This condition of the heart may almost at once be produced by injecting a two per cent. solution of kairin into its substance, by which arrest in systole is produced.

The temporary diastolic cardiac arrest which kairin produces is most probably due to its stimulating effect on the terminal filaments of the pneumogastric, and the vascular dilatation to a similar influence on the ganglia of the vaso-dilators. Kairin must also be considered a muscle poison.

From the results of all these experiments, it is quite clear that kairin reduces temperature, both by diminishing heat production and by increasing heat radiation. The distinctive influence it exerts on the red blood-corpuscles, however, and the weakening effect upon the heart, render its employment objectionable and dangerous.

## II. THALLIN.

The literature on the physiological action of thallin is still more scanty than that of kairin. The only physiological work that I have been able to consult was by Maragliano (*Gazz. d. Osp.*, Milan, 1885, vi. 425-427). According to him, thallin causes a rise, afterward a fall, in the arterial pressure, which fall is attributed to its weakening influence upon the heart, and also to the dilatation it produces in the cutaneous vessels. The frequency of the pulse, as well as that of the respirations, is diminished. By means of the plethysmograph of Mosso, and the calorimeter of Winternitz, Maragliano found that thallin caused considerable dilatation of the cutaneous bloodvessels, which dilatation went hand in hand with the fall in temperature, and the radiation of heat increased as the vessels dilated. The amount of urea and carbonic acid eliminated was found to be diminished. The conclusions at which he arrived were that thallin lowers the temperature by directly diminishing the respiratory capacity of the blood, hence retarding the processes of combustion.

According to Dujardin-Beaumetz (*Therap. Gaz.*, September, 1885), thallin, like kairin, lowers the temperature, not by its influence on the heat centres, but by directly diminishing the respiratory power of the blood and by dissolving out its hæmoglobin. He mentions the case of a tuberculous patient who had received but one gramme of thallin during twenty-four hours. The temperature fell to 89.6° F., and the most strenuous efforts were required to arouse this patient from the state of collapse into which he was plunged.

The cases which have so far been recorded, however, are much more favorable to thallin as an antipyretic likely to have a future than are those of kairin. Alexander (*Centralblatt f. klin. Med.*, Leipzig, 1885, vi. 89-93) used thallin in fourteen cases of febrile disease, and noticed chills and vomiting to occur but once; therefore he was led to consider thallin one of the most valuable of antipyretics, being superior to kairin, though inferior to antipyrin.

According to Mingazzini (*Gazz. d. Osp.*, No. 14, 1885), thallin, as an antipyretic, is superior to both kairin and antipyrin, although hardly to be preferred to the latter.

#### *A. Influence of Thallin on the Heart.*

EXPERIMENT VII.—November 6, 1885. Frog 135 grms. Beef's blood and Ringer's saline (1:1½). Inflow canula in inferior vena cava. Outflow canulas in two aortic trunks. Venous pressure 2.5 c.m. Arterial pressure 20 c.m.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Injections of thallin were made into one of the inflow tubes at the time mentioned on same line in first column.
3.25	—	—	—	Frog in box.
55	52	18	26°	
58	52	18		
4.02	52	18.5		
05	52	18.5		
10	52	18	—	Injected 0.005 grm. of thallin.
11	54	16		
12	52	16		
13	52	14	—	Injected 0.01 grm. of thallin.
17	52	14		
18	50	8		
19	50	10	25.2	Auricles three times their normal size, and almost entirely inactive; ventricle larger than normally, contracting incompletely.
25	52	10	—	Injected 0.01 grm. of thallin.
26	50	9		
27	48	8		
29	46	6		
35	44	3		
37	42	2		
42	33	0	—	Heart arrested in diastole.
5.30	—	—	24.6	Heart much smaller than at last observa- tion. Experiment ended.

EXPERIMENT XXXVIII.—December 21, 1885. Terrapin 930 grms. Beef's blood and Ringer's saline (1:1). Inflow canulas in hepatic vein and inferior vena cava. Outflow canulas in right aorta and pulmonary artery.



Venous pressure 7 c.m. Arterial pressure 24 c.m. Thallinized blood contained 0.1 grm. of thallin in 100 c.c. of normal blood mixture; atropinized blood 0.01 grm. : 100 c.c.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in the first column.
3.05	—	—	18°	Terrapin in box.
20	25	29.5		
25	25	29.5		
30	25	29		
35	25	29		
40	25	28.5	—	On thallinized blood.
41	27	32		
42	22	30		
43	20	30		
44	18	32		
45	16	30		
46	14	32	—	Auricles 3 to 4 times their normal size; rosy, dark-colored, and contracting imperfectly.
47	14	35		
48	12	36	—	Ventricle much relaxed, contracting slug- gishly but completely; cardiac systole ab- normally prolonged; on normal blood mix- [ture.
51	18	54	19	
53	25	40		
56	25	36	—	On thallinized blood.
4.00	25	38		
01	22	33		
03	16	19	—	Auricles continue full and large; ventricle large, contractions peristaltic and far from [complete.
05	16	15		
07	8	13		
10	7	13		
12	7	13	—	On normal blood mixture.
13	9	22		
15	19	38		
17	22	30		
21	25	25	—	Ventricle beginning to resume its normal dimensions; auricles continue same as previously noted.
4.25	25	22	20	On atropinized blood.
26	25	23		
28	25	25		
30	27	28		
31	27	30	—	On thallinized blood.
33	18	28		
37	18	21.5	—	Entire heart very weak and beginning to grow smaller.
40	17	26		
45	8	17	—	On normal blood mixture.
48	8	18		
52	15	25	—	On thallinized blood.
55	14	14		
5.00	14	10		
05	13	5		
10	11	2	—	This observation was followed by temporary diastolic arrest; on normal blood.
19	25	44		
25	21	21		
30	24	22	—	Ventricle almost completely recovered.
35	24	21	20	Auricles paralyzed beyond recovery. Ex- periment ended.

*B. Influence of Thallin on the Bloodvessels.*

EXPERIMENT XXXIV.—December 14, 1885. Terrapin 740 grms. Ringer's saline. Inflow canulas in right and left aortæ. Outflow canula in sinus. Arterial pressure 10. Venous pressure 0. Thallinized saline used in two different proportions, viz., (a) 0.1 gm.: 100 c.c.; (b) 0.15 gm.: 100 c.c.

Time P. M.		Temp.	Total	Outflow	The circulating fluids were supplied to the vessels at the time mentioned on same line in second column.
From	to	Cent.	outflow.	per min.	
3.20	3.56	20.4°	—	—	Terrapin in box.
56	58	—	9	4.5	
58	4.00	—	10	5	
4.00	02	—	11	5.5	
02	04	—	10.5	5.2	
04	06	—	11	5.5	
06	08	—	11	5.5	
08	10	—	10.5	5.2	On thallinized saline (a).
10	12	—	16	5.3	
12	16	—	18.5	6.2	
16	18	—	22.5	11.2	Off thallinized saline; on normal.
18	20	—	27	13.5	
20	22	20.6	26	13	
22	24	—	22	11	
24	26	—	18	9	
26	28	—	16	8	
28	30	—	14	7	
30	32	—	14	7	On thallinized saline (a).
32	34	—	15	7.5	
34	36	—	18	9	
36	38	—	20	10	
38	40	—	24	12	Off thallinized saline; on normal.
40	43	—	35	11.6	
43	45	—	18	9	
45	47	—	15	7.5	
47	50	—	19	6.3	
50	52	—	12	6	
52	54	—	12	6	On thallinized saline (a).
54	57	—	21	7	
57	59	—	22	11	
59	5.01	—	24	12	
5.01	03	—	30	15	
03	05	—	32	16	Off thallinized saline (b); on normal.
05	07	—	36	18	
07	09	—	30	15	
5.09	5.11	21	21	10.5	
11	13	—	16	8	
13	15	—	14	7	
15	17	—	12	6	
17	19	—	14	7	On thallinized saline (b).
19	21	—	18	9	
21	23	—	20	10	
23	25	—	25	12.5	
25	27	—	27	13.5	Off thallinized saline; on normal.
27	29	—	27	13.5	
29	31	—	25	12.5	
31	33	—	22	11	
33	35	—	18	9	
35	37	—	16	8	
37	37	—	15	7.5	
39	41	—	15	7.5	
41	43	21.4	15	7.5	Experiment ended.

EXPERIMENT XLV.—January 2, 1886. Frog 65 grms.; curarized. Tongue observed under microscope magnifying 60 diameters. Measurements of vessels made from camera drawings, stated in  $\mu$ .

Time	Calibre of		Vein.	Remarks.
A. M.	Art.	Cap.		
10.35	2.8	1.0	5.0	
40	2.8	1.0	5.2	Injected 0.03 grm. of thallin into lymph-sac.
45	3.6	2.0	8.2	
50	3.5	2.2	10.6	
55	3.0	2.2	7.8	Velocity of current apparently quickened in arterioles, slowed in veins.
11.00	3.0	2.2	6.6	
05	2.8	2.0	6.8	
10	2.6	2.0	7.0	
15	1.8	2.0	7.4	
20	1.5	2.0	7.2	Color of blood, especially in veins, dark brown.
30	2.8	2.0	6.5	
40	3.0	1.8	6.4	Experiment ended.

Experiment VII. shows (1) that thallin, in very small doses, temporarily increases the rate of the heart, and only very slightly decreases the work done; (2) in larger doses it decreases both the rate and work, but influencing the latter more than the former; (3) in the largest doses it arrests the heart in diastole.

As to time and degree, thallin affects the different parts of the heart as follows: first, the sinus and great veins adjoining it; second, the auricles; and, lastly, the ventricle. The dose of thallin required to produce cardiac diastolic arrest is about five times as large as that of kairin, producing a similar result.

Experiment XXXVIII. admits of the following conclusions: 1. Thallin, in comparatively small doses, slightly increases the rate of the heart, and considerably increases the work done. 2. Larger doses decrease both the rate and the work done, finally producing diastolic arrest. 3. Atropin retards, but is unable to prevent this result. 4. Repeated thallinization of the heart is followed by a peculiar shrinkage of the entire organ, during which it presents the dark color of thallinized blood. 5. The order in which the different parts of the heart are affected is the same for the terrapin as for the frog. To this must be added that the injection of a 1 per cent. solution of thallin into the substance of the ventricle produces systolic arrest within a few minutes.

From Experiments XXXIV. and XLVII., on the bloodvessels, we may conclude (1) that thallin, in comparatively small doses, produces dilatation of the arterioles, followed by a contraction of the same; (2) it produces dilatation of the capillaries; (3) it causes a much greater and much more permanent dilatation of the small veins than of either

the capillaries or arterioles; (4) under thallin venous blood and the walls of the veins assume an abnormally dark color.

Summing up the results of all these experiments with thallin upon the heart and bloodvessels of the frog and terrapin, we notice, first, the striking similarity which exists between it and kairin, the only difference, in fact, being that thallin has a much less injurious influence upon the ventricle, the auricles and bloodvessels being equally affected by both drugs.

The temporary diastolic cardiac arrest produced by both these drugs, we are inclined to attribute for the most part to their stimulating influence on the terminal filaments of the pneumogastric. The dilatation of the bloodvessels, most probably, is produced by their stimulating effect upon the ganglia of the vasodilators. The subsequent contraction of both heart and arterioles is due to their direct action upon the muscular substance.

Thallin, like kairin, reduces temperature by diminishing heat production, and by increasing heat radiation; as an antipyretic it is less dangerous, but no less objectionable, than kairin, for while its effect upon the ventricle of the heart is less depressing than that of kairin, its influence upon the blood-corpuscles is sufficient to condemn it.

### III. HYDROCHINON.

According to Brieger (*Arch. f. Anat. u. Phys.*, 1879), hydrochinon produces dilatation of the arterioles and considerable lowering of blood-pressure. The dose required to reduce the temperature caused no change in rhythm, but sometimes a slight decrease in the rate; the pulse, however, became unusually small and soft, and shortly thereafter collapse ensued, the heart-sounds became inaudible, and the impulse of the heart could not be felt. Brieger also found that hydrochinon had a paralyzing influence upon the frog's heart, especially its muscular substance. The heart ganglia, according to Brieger, are only weakened by strong doses, and not at all affected by small ones.

Seifert (*Berl. klin. Woch.*, 1884, xxi. 450-452) recommends hydrochinon as safe and prompt in its action, its administration being accompanied by but slight disturbances; the cerebral symptoms of typhoid patients were very much improved by its use. From the account which Seifert gives us, we take it that hydrochinon, though lowering the pulse-rate at the same time that it reduces the temperature, slightly increases arterial tension, or, at least, does not lower it under doses which are sufficient to cause a fall in the temperature.

#### *A. Influence of Hydrochinon on the Heart.*

EXPERIMENT XL*a*.—December 22, 1885. Frog 280 grms. Beef's blood and Ringer's saline (1:1). Inflow canula in inferior vena cava. Outflow canulas in two aortic trunks. Venous pressure, at start, 6 c.m. Arterial



pressure 12 c.m. Hydrochinon blood (*a*) contained 0.1 grm. in 100 c.c. of normal blood mixture; Hydrochinon blood (*b*) 0.2:100 c.c.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on same line in first column.
2.30	—	—	—	Frog in box.
3.00	42	22	23°	
05	42	22.5		
10	43	22	—	Venous pressure lowered to 2.5 c.m.
15	43	15		
20	43	15		
25	43	15	—	On hydrochinon blood ( <i>a</i> ).
26	43	16		
27	40	15.5		
28	39	15		
29	39	14.5		
30	37	13	—	Heart larger, and contracting less perfectly than normally.
31	36	13		
32	36	12		On normal blood mixture.
35	38	15	24	
37	40	15		
40	40	15	—	Venous pressure raised to 5 c.m.
45	42	23		
47	42	22.5		
50	42	22	—	On hydrochinon blood ( <i>b</i> ).
52	36	7	—	Great veins, sinus, and auricles quickly paralyzed; three times their normal size; contractions barely perceptible; ventricle much weakened, though still contracting.
53	—	—	—	Blood ceased to come over; venous pressure lowered to 2.5 c.m.
56	21	1		
4.02	32	7		
07	32	7		
15	36	7		
25	40	8.5	25	Ventricle completely recovered; condition of great veins, sinus, and auricles same as previously noted, and apparently beyond recovery. Experiment ended.

EXPERIMENT XXXII.—December 11, 1885. Terrapin 1450 grms. Sheep's blood and Ringer's saline (1:1½). Inflow canulas in inferior vena cava and left superior vena cava. Outflow canulas in pulmonary artery and right aorta. Venous pressure 6 c.m. Arterial pressure 18 c.m. Hydrochinonized blood (*a*) contained 0.05; (*b*) 0.1 grm. of hydrochinon in 100 c.c. of normal blood mixture.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on first line in first column.
3.00	—	—	—	Terrapin in box.
20	26	19	20°	
25	26	18.5		
30	27	18.5		
35	27	18.5		
40	27	18		
45	27	18.5	—	On hydrochinon blood ( <i>a</i> ).
50	25	19		
55	24	22	21	Auricles overdilated; ventricle normal; on normal blood.
4.00	25	19		
05	26	20		

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on first line in first column.
4.10	26	20.5	—	On hydrochinon blood ( <i>b</i> ); auricles still in a passive and overdistended condition.
11	26	20		
13	24	23		
14	12	15	—	Auricles and sinuses as above noted; ven- tricle greatly relaxed; its diastole pro- longed; on normal blood mixture.
16	7	13		
18	9	13		
19	11	15		
21	23	30		
30	25	25	21.2°	
35	25	23	—	On hydrochinon blood.
36	25	25		
38	12	12	—	On normal blood mixture.
39	8	8		
40	10	10	—	Condition of heart as previously noted.
45	19	11		
50	24	22	—	Ventricle recovered but discolored; sinus, veins, and auricles paralyzed beyond re- covery.
55	26	20	—	
5.00	26	18	21.6	Experiment ended.

*B. Influence of Hydrochinon on the Bloodvessels.*

EXPERIMENT XLVI.—December 26, 1885. Terrapin 980 grms. Inflow canulas in right and left aortic trunks. Outflow canulas in sinus. Arterial pressure 13 c.m. Venous pressure 0. Hydrochinonized saline (*a*) contained 1 gm. of hydrochinon: 500 of saline; (*b*) 2 grms.: 500 c.c.; (*c*) 3 grms.: 500 c.c.

Time P. M.		Temp.	Total	Outflow	The circulating fluids were supplied to the ves- sels at the time mentioned on same line in second column.
From	to	Cent.	outflow.	per min.	
2.40	3.10	—	—	—	Terrapin in box.
3.10	3.12	16°	29	14.5	
12	14	—	31	15.5	
14	16	—	32	16	
16	18	—	33	16.5	
18	20	—	32	16	
20	22	—	31	15.5	On hydrochinon saline ( <i>a</i> ).
22	24	—	28	14	
24	26	—	21	10.5	
26	28	—	12	6	
28	30	—	10	5	
30	32	—	14	7	
32	34	17	12	10.5	
34	36	—	27	13.5	
36	38	—	30	15	
38	40	—	36	18	
40	42	—	37	18.5	
42	44	—	42	21	
44	46	—	56	28	On normal saline.
46	48	—	60	30	
48	50	—	52	26	
50	52	—	50	25	
52	55	—	70	26	
55	58	—	65	21.6	
58	4.03	—	90	19	
4.03	05	18	30	15	On hydrochinon saline ( <i>b</i> ).
05	07	—	31	15.5	

Time P. M.		Temp. Cent.	Total outflow.	Outflow per min.	The circulating fluids were supplied to the vessels at the time mentioned on same line in second column.
From	to				
4.07	4.09	—	28	14	
09	11	—	31	15.5	
11	13	—	35	17.5	
13	15	—	38	19	
15	17	—	43	21.5	
17	19	—	45	22.5	
19	22	—	75	25	
22	24	—	52	26	
24	26	—	58	29	On normal saline.
26	20	—	48	24	
28	30	19°	45	22.5	
30	32	—	44	22	
32	34	—	44	22	
34	38	—	78	19.5	
38	41	—	63	21	
41	43	—	42	21	
43	45	—	41	20.5	On hydrochinon saline (c).
45	47	—	45	22.5	
47	49	—	47	23.5	
49	51	—	55	27.5	
51	53	—	58	29	
53	55	—	58	29	
55	57	—	60	30	On normal saline.
57	59	—	51	25.5	
59	5.01	—	42	21	
5.01	03	—	38	19	
03	05	—	37	18.5	
05	07	—	36	18	
07	09	—	35	17.5	
09	11	—	35	17.5	
11	13	20	36	18	Experiment ended.

EXPERIMENT XLβ.—December —, 1885. Frog 64 grms; curarized. Tongue, under microscope magnifying 60 diameters. Measurements of vessels made from camera drawings, stated in  $\mu$ .

Time P. M.	Calibre of			Remarks.
	Art.	Cap.	Vein.	
2.30	4.4	0	5.2	No capillaries apparent.
35	4.4	0	5.4	Injected 0.03 of hydrochinon into lymph-sac.
40	4.6	1.5	7.2	Capillaries abundant.
45	4.6	1.5	8.4	
50	4.6	1.5	9.0	
55	4.6	1.5	9.2	Velocity of current quickened in arterioles, slackened in veins.
3.10	4.4	1.2	9.0	
20	4.4	1.2	7.5	
35	4.4	1.2	7.4	Applied 5 drops of one per cent. solution of hydrochinon in saline to surface of tongue.
42	4.6	2.0	8.0	
50	4.8	2.0	9.6	
55	4.4	2.0	9.4	Washed away hydrochinon with salt solution
4.00	4.0	2.0	8.4	
10	3.6	1.5	8.6	
20	3.2	1.2	8.8	
25	3.2	1.0	8.6	Circulation still brisk in arterioles, abnormally slow in veins.
30	3.4	1.0	8.6	Experiment ended.

Experiment XL $\alpha$ . shows (1) that small doses of hydrochinon, in the frog, reduce the rate of the heart and the amount of work done; (2) that larger doses quickly paralyze the great veins, sinus, and auricles in the order in which they are named, while the ventricle is affected but slightly; (3) increasing venous pressure will materially hasten this occurrence.

Experiment XXXII. shows (1) that, in the terrapin, small doses of hydrochinon slightly increase the amount of work done by the heart, but reduce its rate; (2) larger doses rapidly reduce both rate and work, finally arresting the auricles and sinus in diastole, the ventricle, though much weakened, not being affected to that extent; the ventricle recovers quickly and completely, the auricles slowly and imperfectly.

In both the frog and the terrapin the great venous trunks adjoining and communicating with the sinus may be dissected out at some distance from the latter and canulas tied in, so that these veins remain in sight during the whole experiment. Under normal conditions, and as a sign that the venous pressure has been duly proportionate to the capabilities of the heart under observation, cardiac systole may be observed to start with a contraction of these veins, the contraction-wave travelling through the intervening structures until it reaches the ventricle; their contractions, in most cases, are as perfect and complete as are those of the auricles or ventricle. The same blood which flows into the sinus and then runs through the heart, also passes into these veins, and therefore the influence of poisoned blood on them can be observed as well as upon the other structures.

Experiment XLVI. shows that hydrochinon causes at first a contraction, followed by a dilatation of the arterioles and capillaries; large doses seem at once to dilate these vessels.

Experiment XL $\beta$ . shows (1) that hydrochinon produces dilatation of the arterioles and capillaries, which dilatation is followed by an abnormal contraction; (2) that it causes dilatation of the small veins, which dilatation is much more extensive and lasting than that of either the capillaries or arterioles; (3) it quickens the flow in the arterioles and slows it in the veins; (4) it imparts a deep purplish color to the blood flowing in the veins; (5) the effect is the same, whether hydrochinon is injected hypodermatically or is used externally; when injected, muscular twitchings come on, which necessarily interfere with the study of the vessels of the tongue.

From all these experiments made with hydrochinon on the heart and bloodvessels of the frog and terrapin, we must arrive at the conclusion that it reduces temperature mainly by increasing heat radiation, owing to its influence upon the veins, which it largely dilates, and the capillaries and arterioles, which it also dilates, though to a less extent. Through



its influence upon the red blood-corpuscles it probably also diminishes heat production, by an impairment of their respiratory capacity.

The singular but noteworthy fact, observed under the microscope on the frog's tongue and elsewhere, that kairin, thallin, and also hydrochinon change the color preferably of venous blood, seems to point to a peculiar affinity of these substances for such blood, and it is not at all unlikely that the presence of carbonic dioxide in venous blood is the cause of its chemical decomposition underlying the appearance of this phenomenon. The peculiar coloring principle thus set free diffuses itself through the walls of the veins into the neighboring tissues.

When we now compare the action of hydrochinon upon the heart and the bloodvessels of the frog and terrapin, with that of kairin and thallin, the result shows that hydrochinon affects the ventricle of the heart still more favorably than thallin; the auricles, however, are as promptly paralyzed by hydrochinon as they are by thallin, and even kairin. All three largely dilate the veins, for which they show a decided preference, and they also dilate the capillaries and arterioles; the dilatation of the latter, however, is either preceded or followed by an abnormal contraction, especially noticeable when the drug was injected hypodermatically. On hypodermatic injection of all three of the drugs, slight muscular spasm may be seen on the frog's tongue.

The action of hydrochinon, then, being similar to that of kairin and thallin so far as the heart and bloodvessels are concerned, the explanation of its action must, in like manner, be similar (see page 387). The peculiar affinity of kairin, thallin, and hydrochinon for veins and venous blood cannot be explained by these experiments.

#### IV. RESORCIN.

Comparatively little is known about the physiological action of resorcin on the circulatory apparatus. Russo-Giliberti, by means of the cromocitometer of Bizzozero, ascertained that resorcin temporarily increases the hæmoglobin of the blood; he also found that it decreases the elimination of carbonic acid. (*Arch. p. l. Sc. Med.*, Torino, 1883-84, vii. 171-186.)

Resorcin is said to possess decided antiseptic properties, and has frequently been recommended in putrid affections of the naso-pharynx and genito-urinary organs. In fever patients it reduces the temperature in doses of 1.5 gramme, but 3 grammes are often found necessary. A full dose of the drug is generally followed by dizziness, ringing in the ears, reddening of the face, an acceleration of the respiratory movements, and also the pulse-rate; the cutaneous vessels are congested, and the whole surface is bathed in perspiration. Dujardin-Beaumetz found intense visceral, and especially pulmonary, congestion in animals killed by resorcin, and does not recommend its employment as an antipyretic.

*A. Influence of Resorcin on the Heart.*

EXPERIMENT X.—November 10, 1885. Frog 110 grms. Beef's blood and Ringer's saline (1 : 1). Inflow canula in inferior vena cava. Outflow canulas in right and left aortæ. Venous pressure 3.5 c.m. Arterial pressure 20 c.m. Solution of resorcin used for injection into inflow tube containing 1 gm. : 50 c.c.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Injectations made at time mentioned on same line in first column.
2.30	—	—	—	Frog in box.
3.10	48	14.5	25°	
15	48	14.5		
20	48	15.5		
25	48	16		
30	48	15.5	—	Injected 0.01 gm. of resorcin.
34	48	15	24	
36	48	15	—	Injected 0.02 gm. of resorcin.
38	46	13.5		
40	46	14		
45	46	15	—	Injected 0.04 gm. of resorcin.
45 <sup>20</sup>	—	—	—	Complete diastolic arrest of both auricles and ventricles; applied atropin in solu- tion (1 : 500) to surface of ventricle.
55	40	18	23	
4.00	42	15	—	Recovery of all parts of heart perfect.
05	42	15		
13	43	14		
16	45	14	—	Injected 0.04 gm. of resorcin.
17	42	5	—	Auricles distended and motionless; ven- tricle unaffected.
18	42	10		
25	44	13.5	—	All parts of heart recovered.
35	45	13.5	22	Injected 0.05 gm. of resorcin. After 20 contractions, diastolic arrest of the whole heart occurred; pressure lowered.
42	40	10	—	Auricles seem permanently affected; ven- tricle completely recovered.
52	43	10		
5.00	45	8	—	Experiment ended.

EXPERIMENT XIX.—November 20, 1885. Terrapin 940 grms. Beef's blood and Ringer's saline (1 : 1½). Inflow canulas in left superior and inferior venæ cavæ. Outflow canulas in right and left aortæ. Venous pressure 3 c.m. Arterial pressure 20 c.m. Resorcinized blood contains 1 gm. of the drug in 500 c.c. of normal blood mixture.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Circulating fluids were supplied to heart at time men- tioned on same line in first column.
3.15	—	—	—	Terrapin in box.
55	33	22	23°	
4.00	32	22		
10	33	22		
24	33	22	—	Raised venous pressure to 7 c.m.
25	34	45		
26	34	46	—	Lowered venous pressure to 3 c.m.
30	33	23	—	On resorcinized blood for one minute.
31	34	20.5		
32	34	16.5	—	Sinus and auricles large and overdis- tended; their contractions much weak- ened; ventricle not affected.

Time P.M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	Circulating fluids were supplied to heart at time mentioned on same line in first column.
4.33	33	16		
35	33	17.5		
39	33	21	24°	
41	33	20.5	—	Heart in normal working order.
43	33	20	—	On resorcinized blood for two minutes.
45	34	12		
47	35	7		
49	35	4	—	Great veins, sinus, and auricles paralyzed; ventricle but slightly weakened.
53	35	12		
57	35	12.5		
5.04	35	12		
10	33	10		
40	34	6	—	Auricles beyond recovery; ventricle in perfect condition. Experiment ended.

*B. Influence of Resorcin on the Bloodvessels.*

EXPERIMENT XLI.—December 23, 1885. Terrapin 895 grms. Inflow canulas in right and left aortic trunks. Outflow canula in venous sinus. Arterial pressure 20 c.m. Venous pressure 0. Resorcinized saline contained 0.1 : 100 c.c.

Time P.M.		Temp.	Total	Outflow	Circulating fluids supplied to the vessels at the time mentioned on same line in second column.
From	to	Cent.	outflow.	per min.	
3.26	—	—	—	—	Terrapin in box.
40	42	20°	24	12	
42	44	—	25	12.5	
44	46	—	24	12	
46	48	—	25	12.5	
48	50	—	26	13	On resorcinized saline.
50	52	—	18	9	
52	54	—	34	17	
54	56	—	50	25	On normal saline.
56	58	21	62	31	
58	4.00	—	52	26	
4.00	02	—	40	20	
02	04	—	40	20	
04	06	—	38	19	
06	08	—	41	20.5	
08	10	—	42	21	On resorcinized saline.
10	12	—	48	24	
12	14	—	70	35	On normal saline.
14	16	—	74	37	
16	18	21.6	62	31	
18	20	—	54	27	
20	22	—	54	27	
22	24	—	60	30	
24	26	—	54	27	
26	28	—	54	27	
28	30	—	54	27	On resorcinized saline.
30	32	—	68	34	
32	34	—	85	42.5	On normal saline.
34	36	—	88	44	
36	38	22	85	42.5	
38	40	—	76	38	
40	42	—	65	32.5	
42	44	—	62	31	
44	46	—	60	30	

Time P.M.		Temp.	Total	Outflow	Circulating fluids supplied to the vessels at the time mentioned on same line in second column.
From	to	Cent.	outflow.	per min.	
4.46	4.48	—	60	30	
48	50	—	64	32	
50	52	—	62	31	
52	54	—	64	32	
54	56	—	65	32.5	
56	58	—	66	33	
58	5.00	—	66	33	
5.00	02	22.6°	65	32.5	
02	04	—	65	32.5	On normal saline.
04	06	—	70	35	
06	08	—	88	44	On resorcinized saline.
08	10	—	85	42.5	
10	12	—	80	40	
12	14	—	75	37.5	
14	16	—	68	34	
16	18	23	65	32.5	Experiment ended.

EXPERIMENT LIII.—January 6, 1886. Frog 86 grms. Curarized; tongue observed under microscope magnifying 60 diameters. Measurements of vessels made from camera drawings, stated in  $\mu$ .

Time A.M.	Calibre of		Vein.	Remarks.
	Art.	Cap.		
11.20	4.2	1.0	5	
25	4.2	1.0	5.2	
30	4.2	1.0	5.4	
35	4.2	1.0	5.2	5 drops of two per cent. solution of resorcin in saline applied to surface of tongue.
40	4.6	1.4	9.2	
45	5.2	1.6	10.8	Resorcin washed away with saline.
50	5.0	1.4	10.2	
55	5.0	1.0	9.8	
12.00	4.8	1.0	9.0	
05	4.0	1.0	9.0	
10	4.0	1.0	9.0	Surface of tongue very red, presenting the appearance of intense congestion.
15	3.6	1.0	8.6	
25	3.4	1.0	8.2	Experiment ended.

Experiment X. shows (1) that resorcin, in small doses, has no appreciable influence on either the rate of the heart or its work done; (2) larger doses reduce both rate and work; (3) still larger doses produce diastolic arrest; (4) atropin antagonizes its action to a certain extent only; (5) the sinus and auricles are much more quickly affected than the ventricle.

Previous experiments with resorcin on the heart having quite sufficiently demonstrated its strongly paralyzing influence upon sinus and auricles, very low venous pressure was used throughout Experiment XIX. In this manner any possibility of their being overworked was eliminated, and the fact that they were really in an excellent condition and capable of doing twice the amount of work which they were actually performing is shown in the observation taken at 4.25 P.M., at which



time, the venous pressure having previously been raised, the amount of work done was greatly increased.

Notwithstanding this, the veins, sinus, and auricles were promptly paralyzed by moderately large doses of resorcin, and lowering of the venous pressure had henceforth no effect on their condition, and, of course, raising it caused only a passive overdilatation.

The ventricle, throughout this experiment and the three others on the terrapin with resorcin, showed a rather remarkable resistance to the influence of this drug, and the only effect it produced was a slight weakening and a considerable reduction in the rate of contraction. Very large doses, however, give rise to temporary diastolic arrest of the heart in the terrapin as well as in the frog.

The rather remarkable and quite unusual effect of resorcin on the rate of the heart's contractions, as shown in this experiment, is the result of the low venous pressure which was used.

From these and other experiments with resorcin on the heart, the conclusions are as follows: (1) Resorcin, in small doses, improves the heart's action; (2) In doses of medium size it paralyzes the sinus and auricles, but has little effect on the ventricle; (3) In very large doses it at once causes diastolic cardiac arrest, the ventricle recovering sooner or later, the auricles rarely ever.

Experiment XLI. on the bloodvessels shows that resorcin causes first contraction, then dilatation of the arterioles and capillaries.

Experiment LIII. shows—(1) That resorcin slightly dilates the arterioles, their dilatation being followed by contraction beyond the normal; (2) That it causes dilatation of the capillaries; (3) That it promptly and largely dilates the small veins, their dilatation far outlasting that produced in the arterioles and capillaries.

A consideration of the results of these experiments leads to the conclusion that resorcin reduces the temperature by increasing heat radiation by the dilatation it produces in the capillaries and veins, especially the latter.

The same quite remarkable preference for the venous side of the heart and vascular system is shown by resorcin in nearly the same degree as by thallin and hydrochinon. Resorcin paralyzes the auricles in doses which seem to improve rather than impair the contracting power of the ventricle, and it largely dilates the veins, while the arterioles are affected but very slightly.

As is the case with kairin, thallin, and hydrochinon, resorcin reduces the rate of beat of the heart probably by a stimulating influence on the terminal filaments of the pneumogastric, and dilates the vessels through a similar influence on the ganglia of the vasodilators. The tonic effect which it has upon the ventricle is most probably due to its direct action upon the muscular substance of the heart. We have, so

far, no explanation of the difference in the action of these drugs upon the two sides of the heart and vascular system. Nevertheless, the fact remains that all of the drugs so far considered possess this property nearly to the same extent. The only difference regarding their influence upon the heart lies in the ventricle. Kairin and thallin, in small doses, exercise but a *temporary* tonic influence over its contraction hydrochinon and resorcin a more *permanent* one. They all quickly paralyze the auricles and lower the tone of the walls of the veins. The natural consequence is that a much greater quantity of blood will be contained in the veins than in the arteries, and its passage from the veins back into the ventricle is greatly impeded, owing to the paralyzed condition of the auricles. Collapse, therefore, ensues; not so much from failure of the action of the ventricle, as from the danger of *bleeding the animal to death into its own veins*, to use the words of Ludwig.

#### V. ANTIPYRIN.

Bettelheim (*Med. Jahrb. k. k. Ges. d. Aerzte*, Hefte ii. and iii., 1885) found that the injection of antipyrin caused a rise in the temperature over the integument and a fall in the rectum. This rise in the temperature of the integument was accompanied by a fall in the arterial pressure, and lasted for some time after the pressure began to rise; he was, therefore, led to conclude that the reduction in temperature following the administration of antipyrin is due to its causing a dilatation of the peripheral vessels and a contraction of the vessels of the viscera; hence, more blood being carried to the periphery, heat radiation is considerably increased. Bettelheim did not notice any deleterious action of antipyrin on the heart. Queirolo (*loc. cit.*) also found that it produced a dilatation of the cutaneous bloodvessels, and that this condition of the vessels generally precedes the fall in temperature.

According to Cappola, the action characteristic of antipyrin is that it produces a fall in the temperature, normal or pathological. This apyrexia, he thinks, does not depend upon its retarding the processes of combustion within the organism, for antipyrin has no such influence; nor does it depend upon cardiac depression, for the contractions of the heart are much increased in force, and the blood-pressure is not lowered. In his opinion, which is based upon experiments upon the vessels of the lungs of the frog and the dog, antipyrin produces its characteristic effect by dilating the bloodvessels, and in doing this it facilitates the radiation of heat. This dilatation is, furthermore, said to be independent of the vasomotor centres, for it takes place in the vessels of isolated organs, and is therefore due to a direct action of antipyrin upon the blood-vascular walls, probably to stimulation of the vasodilator nerve ganglia. In order to induce poisoning by this drug, it requires doses which are far greater than those which are necessary for the production of apyrexia.

Death takes place by arrest of respiration. Even when administered in toxic doses, Cappola found that the blood-pressure did not diminish, and the heart continued to beat with great energy, and was finally arrested in systole (*Arch. It. de Biol.*, 1884, fasc. ii. 134). Filehne found the heart after death arrested in diastole, and also Arduin states that antipyrin kills by heart paralysis.

In therapeutical literature we find two cases of collapse reported as occurring after the use of antipyrin in typhoid fever patients. But, with the exception of these two cases, not one of the newly discovered remedies of the class of antipyretics is so favorably spoken of and so generally recommended as is antipyrin. All clinicians, after thoroughly and extensively experimenting with this remedy, agree that it is absolutely safe, and reduces the temperature promptly, and without causing any of the bad symptoms characteristic of the administration of kairin, thallin, etc. The perspiration which sometimes occurs is a relief for the patients, and not at all unpleasant.

Guttman (*Berl. klin. Woch.*, 1885, xxii. 377, 401) pronounces antipyrin the safest and most powerful of all antipyretics, and Lehmann attributes to it all the good qualities of a perfect antipyretic.

My experiments with this drug are confirmatory of the many good qualities possessed by antipyrin.

#### *A. Influence of Antipyrin on the Heart.*

EXPERIMENT XXX.—December 7, 1885. Frog 195 grms. Sheep's blood and Ringer's saline (1:1½). Inflow canula in inferior vena cava. Outflow canula in two aortic trunks. Venous pressure 3 c.m. Arterial pressure 10 c.m. Antipyrinized blood contains 1 grm. in 100 c.c. of normal blood mixture.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in the first column.
3.20	—	—	—	Frog in box.
40	29	10	15.4°	
45	29	10		
50	29	10		
55	29	10		
4.00	29	10		
05	29	10		
10	29	9.5	15.8	
15	30	9.5		
20	30	9.5	—	On antipyrinized blood.
22	29	10		
24	27	10		
26	26	10.5	—	Auricular contractions much more thorough than under normal blood; ventricular systole more complete and considerably [prolonged.]
30	25	10.5		
35	23	10		
40	21	10	—	On normal blood mixture.
45	24	9	15.2	
50	24	9		
55	24	9		
5.00	24	8.5	—	On antipyrinized blood.
03	21	7		
06	20	7		

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in the first column.
5.09	19	7		
12	19	7		
15	18	6.5	—	Entire heart much smaller than under normal blood; auricles contracting com- pletely; ventricle same, looks whitish [during systole.
20	18	6.5		
25	17	6.5		
30	16	6.2	—	On normal blood.
35	19	7		
40	20	7		
50	21	7	—	Venous pressure raised 2 c.m.
55	25	10		
6.00	28	12	—	Heart in perfect working order.
05	28	12		
10	28	12.5	—	Experiment discontinued.

EXPERIMENT XVIII.—November 19, 1885. Terrapin 1120 grms. Beef's blood and Ringer's saline (1:1½). Inflow canula in inferior vena cava. Outflow canulas in right and left aortæ. Venous pressure 7 c.m. Arterial pressure 22 c.m. Antipyrinized blood in different degrees of strength was used.

Time P. M.	Rate per min.	Work in c.c. per min.	Temp. Cent.	The circulating fluids were supplied to the heart at the time mentioned on the same line in the first column.
3.10	—	—	—	Terrapin in box.
3.50	31	29	22°	
55	31	28		
4.00	31	29		
05	32	30		
08	32	30		
16	32	30	—	On antipyrinized blood (1 grm.: 500 c.c.).
18	32	40		
21	32	41		
24	32	41		
27	32	41	—	Through 500 c.c. of antipyrinized blood; on normal blood.
29	33	31	22.5	
35	33	26		
40	33	25		
45	32	25	—	On antipyrinized blood (2 grms.: 500 c.c.).
47	33	30		
52	32	40		
55	32	40		
58	32	40		
5.00	32	32	—	Through 500 c.c. of antipyrinized blood; on normal blood.
04	33	27		
07	33	26		
10	33	25	—	On antipyrinized blood (4 grms.: 500).
12	33	30		
15	32	35		
18	31	32	22	
20	30	29		
22	30	25		
25	29	25	—	Through 500 c.c. of antipyrinized blood; [on normal blood.
27	30	26		
29	30	30		
31	31	30		
33	31	26		
40	33	25	—	Experiment ended.



*B. Influence of Antipyrin on the Bloodvessels.*

EXPERIMENT XXIV.—December 5, 1885. Terrapin 870 grms. Inflow canulas in right and left aortæ. Outflow canula in sinus. Arterial pressure 12 c.m. Venous pressure 0. Antipyrinized saline contained 1 gm. of antipyrin to 100 c.c. of Ringer's saline.

Time P.M.		Temp.	Total	Outflow	
From	to	Cent.	outflow.	per min.	
2.15	2.45	26.6°	—	—	Terrapin in box.
45	47	27.2	12	6	
47	49	—	11.5	5.7	
49	51	—	12	6	
51	53	—	12	6	
53	55	—	13	6.5	
55	57	—	13	6.5	On antipyrinized saline.
57	59	—	13	6.5	
59	3.01	—	13	6.5	
3.01	03	28	13	6.5	
03	05	—	19	9.5	
05	07	—	35	17.5	
07	09	—	46	23	Off antipyrinized saline.
09	11	—	50	25	
11	13	—	50	25	
13	15	—	48	24	
15	17	—	42	21	
17	19	—	40	20	
19	21	—	37	18.5	On antipyrinized saline.
21	23	—	30	15	
23	25	—	28	14	
25	27	—	28	14	
27	29	28.4	28	14	
29	31	—	28	14	
31	33	—	28	14	Off antipyrinized saline.
33	35	—	35	17.5	
35	37	—	40	20	
37	39	—	48	24	
39	41	—	50	25	
41	43	—	48	24	
43	45	—	44	22	On antipyrinized saline.
45	47	—	42	21	
47	49	—	38	19	
49	51	—	37	18.5	
51	53	29	36	18	
53	55	28.2	34	17	
55	57	—	30	15	Off antipyrinized saline.
57	59	—	30	15	
59	4.01	—	29	14.5	
4.01	03	—	26	13	
03	05	—	25	12.5	
05	07	—	25	12.5	
07	09	—	28	14	On antipyrinized saline.
09	11	—	32	16	
11	13	—	37	18.5	
13	15	—	44	22	
15	17	—	35	17.5	
17	19	—	34	17	
19	22	—	47	15.6	Off antipyrinized saline.
22	24	—	29	14.5	
24	26	—	26	13	
26	28	—	25	12.5	
28	30	—	24	12	
30	32	—	24	12	
32	34	—	25	12.5	Experiment ended.

EXPERIMENT LVI.—January 7, 1886. Frog 94 grms.; curarized. Tongue observed under microscope magnifying 60 diameters. Measurements of vessels made from camera drawings, and stated in  $\mu$ .

Time P. M.	Art.	Calibre of Cap.	Vein.	Remarks.
2.35	5.4	1.0	6.2	
37	5.4	1.0	6.4	
40	5.4	1.0	6.4	Injected 0.05 grm. antipyrin into lymph-sac.
42	5.2	1.0	7.0	
44	4.8	1.0	7.0	
47	5.0	1.5	7.2	
50	5.2	1.4	7.4	
53	5.2	1.4	7.4	Applied to surface of tongue solution of 1:500.
56	5.2	2.0	7.4	
4.00	5.2	2.0	8.0	
05	5.0	2.0	8.0	Applied solution of 1:100
10	5.0	2.0	8.6	
14	5.0	2.6	9.6	
19	5.4	2.6	9.8	
24	5.4	2.8	10.6	Current in veins much slowed; arteries still very active; no flow in some capillaries.
27	5.4	2.8	12.4	
30	6.0	2.8	13.2	
40	6.2	2.8	14.2	Experiment ended.

At the end of this experiment, the current in all superficial capillaries and veins was entirely arrested, due to a coagulation of the blood within their walls. There was a rich, thick plexus of the capillaries not noticed at the beginning. The deeper veins and capillaries, as also the arterioles, were still pervious, and a brisk current was running through them.

Experiment XXX. shows that it requires enormous doses of antipyrin to reduce appreciably the amount of work done by the heart of the frog, otherwise so sensitive; the rate is reduced much more quickly than the work done; the muscular structure remains unaffected, and the force of the cardiac contractions is rather intensified than diminished.

Experiment XVIII. shows that smaller doses than were used in the previous experiment increase the work done 25 per cent. and have no influence at all on the rate. Even a dose of 2 grammes of the drug passed through the heart within fifteen minutes increases the work without reducing the rate; it required 4 grammes of antipyrin to bring about an appreciable decrease in the rate and the work done. At the end of both these experiments the energy of the hearts under observation left nothing to be desired, notwithstanding the fact that their own weight of the drug had been passed through them several times during that period.

The same must be said in regard to the bloodvessels of the terrapin; for it was found that a 1 per cent. solution of the drug in Ringer's saline was required to produce dilatation of the arterioles.

Experiment LVI. shows that antipyrin, in very small doses, injected

into the lymph-sac of the frog very slightly contracts the arteries, but dilates the capillaries and veins; in large doses, applied directly to the surface of the tongue, it gives rise to extensive dilatation in the veins and also the capillaries; a 1 per cent. solution of it applied to the tongue of the frog will, after a short time, cause coagulation in all the superficial bloodvessels.

The manner in which antipyrin reduces temperature is purely by increasing heat radiation, owing to its extensively dilating the veins and capillaries; but what stamps it as an excellent antipyretic is that, besides dilating the veins, it also has a tonic influence on the heart and slightly increases arterial pressure, or at any rate does not cause a diminution of the same. It has, moreover, no injurious influence on the blood or the muscular tissues, and strengthens the auricles.

The objection to the employment of kairin and thallin as antipyretics is from the fact that they cause heart paralysis, especially affecting the auricles, in doses only slightly larger than are sufficient to produce a lowering of the temperature. But this objection becomes an absolute danger when we take into account the destructive influence upon the blood corpuscles and tissues generally.

Hydrochinon and resorcin, although not exerting the same weakening and directly paralyzing influence upon the ventricle of the heart which is peculiar to kairin and thallin, both paralyze the venous side of the heart, viz., the auricles, and greatly lower the tone of the walls of the veins. The extra amount of blood, therefore, which is driven into the veins through the increased action of the ventricle, is only with great difficulty returned to the ventricle, and here the danger is not so much from failure in the power of the ventricle as in the case of kairin and thallin, as from the danger of *bleeding the animal to death into its own veins*. The intense visceral and especially pulmonary congestion found on post-mortem, by Dujardin-Beaumetz, and others, in animals killed by resorcin, seems to confirm this view of the matter.

Antipyrin, though largely dilating the veins, increases the power of contraction of both auricles and ventricle, and has no injurious influence upon the blood nor the muscular tissues, and therefore possesses, indeed, all the good qualities of a perfect antipyretic.

LABORATORY OF THE MUSEUM OF HYGIENE,  
WASHINGTON, D. C.

ON THE PATHOLOGY OF ARTERIO-CAPILLARY FIBROID KIDNEY.<sup>1</sup>

CARDIO-VASCULAR, SYSTEMIC, CHRONIC.

BY SIR WILLIAM W. GULL, BART., M.D., F.R.S.

THE subject is still but imperfectly appreciated. Whether the views contended for are in accordance with an enlightened pathology time must make evident, but this much may, perhaps, without presumption, be insisted upon, that the unity of Bright's disease is not in accordance with clinical experience. That there should be but one kind of lesion of the kidney, and but one renal pathology, needs only to be stated to be refuted. That various causes should lead on to destructive changes in the kidneys was to be anticipated, and that such changes, as they advanced, should approximate in outward character, was also to be looked for, but that this should be taken as a proof of unity of pathological cause, appears to be contrary both to sound histology and to clinical fact. The time has long come for an advancing differentiation of the states associated with albuminuria and renal lesions.

It need not be stated here that next to or even equal with the pulmonary functions, the renal functions stand foremost for the maintenance of health. If the former represents aërial respiration, the latter represents aquatic respiration. The one clears the system of gaseous, the other of solid excreta. The water function in the body is probably not yet as much considered as it deserves to be, and our practical ideas of the circulation are too much restricted to the onward current through the capillary vessels, whilst the interstitial circulation, the transit of the blood plasma and water through the textures of the organs, is too often ignored.

It is in the course of this interstitial circulation through the arteriole and capillary walls, that the first difficulty occurs which leads on to arterio-capillary fibroid changes, whether in the kidney or elsewhere. These changes are characteristic of a widespread pathology of the vascular system supervening about the middle and later periods of life.

It would be merely conjectural at present to assert that an alteration of blood plasma is the first step in this difficulty, as against its beginning in the vascular walls. The theory of the primary blood dyscrasia is maintained by those who think there is evidence that some defect in the renal function always precedes arterio-capillary fibrosis. Clinically observed, it would seem certain in many cases that the renal change is subsequent to a systemic cardio-vascular change. Neither does it in-

<sup>1</sup> Read at the Copenhagen Medical Congress, 1883.



validate such clinical observation to show that this condition may arise in certain cases of long-standing renal diseases in the middle and active periods of life, but certain it is that a large class of destructive renal diseases do not lead to this cardio-vascular change with hypertrophy of the heart.

The subject of the following remarks has been variously designated, according to the general aspect which the kidney presented on the post-mortem table; namely, *Bright's contracted kidney in the third stage*; *the granular kidney*; *the cirrhotic kidney*; *the kidney of interstitial nephritis*.

Objections might be made to each of these terms. First, as to the use of the term "Bright's kidney." Bright's investigations had no relation to one particular form of disease of the kidneys. His observations were from a clinical standpoint, and included all cases in which the urine was albuminous during life. The various forms which the kidney presented after death were no further classified by him than as "large and smooth," and "small and granular," and the intermediate condition, where the kidney was either of normal size and weight, or rather larger or rather smaller than normal, the surface being irregularly smooth, or irregularly granular. This intermediate stage of size and surface was vaguely regarded as having relations, on the one hand, to the large white kidney from which in the process of time it had contracted, and, on the other, to the small and granular form to which it was supposed to be tending, and to which it would have reached if life had lasted. In this sense, therefore, the "Bright's kidney" included every form of renal change, the whole series being characterized by albuminous urine during life. Again, the word "contracted" in the term "Bright's contracted kidney" implied, though it did not assert, a community of renal changes, first of swelling and then of contraction.

Erroneous as this theory is, and fully as the error of it has been exposed by all modern writers of authority on renal diseases, it is still very tenacious of life, and maintains itself against these attacks. The permanence of this narrow position is probably mainly due:

(1) To the habit of regarding the diseases of the kidney as of one form and nature, and further as the source and starting-point of the several lesions throughout the system associated with them; as though renal disease were always one, and had always a renal origin, and as though all the morbid changes associated with it were its effects, and had sprung from failure of the renal function.

(2) To the assumption that albumen in the urine indicates one pathology; and

(3) To the occurrence post mortem, in the several forms of renal disease, of histological changes which are more or less common to all the forms; and, hence, an erroneous inference that they are of one kind, and have an identical pathology, as though one should assert that all scars

of the skin, seeing that they have largely common histological characters, have also one pathology.

It would seem not to be sufficiently considered that, in the nature of the case, the morbid forms of histological expression are limited whatever may be their pathology; and, hence, these lines of morbid tissue change will have a tendency to approach each other as they proceed. For example, interstitial nephritis and its results in fibroid tissue and contraction, may occur in kidneys in which the morbid agencies may entirely differ amongst themselves. In catarrhal nephritis there are various degrees of interstitial nephritis, which may produce granulation of the organ, though such interstitial change and granulation may have a quite different meaning from that which occurs in the fibroid kidney which is the special subject of this communication. And the same might be said of the nephritis of scarlatina, of pregnancy, and of other forms. In fact, to repeat what has already been said, in all cases of renal lesions, there will be an approximation more or less to histological changes common to the whole.

Whilst asserting this, it is not my intention to convey the idea that the morbid anatomy of the kidney is not distinctive of the pathological condition out of which it springs; but that a full criticism of differences requires a survey of morbid cause, clinical history, and associated tissue changes in other organs, as well as of those which occur locally in the kidney; and that without this more complete survey, renal pathology may be expected to remain defective and unprogressive. The truth of this statement will be more evident, though at the same time the prejudice against accepting it will be stronger, in proportion to the limitation of our views to the final results of disease on the kidneys themselves. For, however the lesion may have begun, and from whatever cause it may have sprung, its results are destructive; and in the process of destruction they must approximate toward each other, and, therefore, contraction, granulation, and atrophy may occur in any nephritis, and the exclusively morbid anatomist will readily find on the post-mortem table a strong confirmation that there is but one nephritis, one Bright's disease; whilst, in contrast to this barren conclusion, the pathologist, surveying the life history of these cases, will probably with more approximation to truth, find that the words "Bright's disease" have no clinical significance and no value except for the satisfaction of slipshod and unprogressive therapeutists. It will seem to him, probably, that the kidney is not necessarily the centre from which all renal pathology can be studied. Without in the least minimizing the importance of renal lesions in themselves, and their reactive effects on the organism, we believe it will become more and more evident that antecedent and coincident systemic changes must be more and more studied before the pathology of nephritis is concluded.

Any other exclusive line of inquiry lays us open to the objection that we are seeking "the living among the dead," and exposes us to Goethe's satire :

"Wer will was Lebendig erkennen und beschreiben,  
Sucht erst den Geist heraus zu treiben—  
Dann hat er die Theile in seiner Hand  
Fehlt leider! nur das geistige Band."

With these preliminary remarks, which apply *mutatis mutandis* to all pathological terms which would convey the idea that destructive changes in the kidneys have all a local origin, and constitute the chief pathological entity, I pass on to that which, as I have said, is the special subject of my communication, namely, fibrosis, or arterio-capillary fibrosis of the kidney, as it occurs at or after the middle period of life.

And here I leave, on one side, those forms of nephritis which are variously termed parenchymatous nephritis, albuminous nephritis, tubular nephritis, amyloid change, surgical kidney, scrofulous kidney, nephritis of pregnancy, and such other forms as confessedly have a more limited and local pathology.

In the year 1872, my friend, Dr. Sutton, and myself having clinically observed that cardiac hypertrophy of the left ventricle without valvular disease, and of the same character as that which goes with the contracted kidney of Bright's disease, might occur without renal change, or might precede it, set ourselves to inquire into the pathology of those cases which had hitherto been unclassified. Up to that time cardiac hypertrophy, with renal fibrosis, was explained on the theory that the blood, being imperfectly depurated by the kidney, caused a spasm, and subsequent hypertrophy of the vessels, which prevented the flow of impure blood through the organs, and called for increased power on the part of the heart to meet this difficulty.

The insufficiency of this theory became at once apparent when it was seen that the same cardiac hypertrophy might precede any sign of renal change, and might occur before there was any evidence of defective renal excretion; and to be sure of this, we were not satisfied with the ordinary examinations of the urine, but we obtained through a high authority<sup>1</sup> a complete analysis of such urine for twenty-four hours, which showed that there was no noticeable defect in its composition. This, therefore, as it may be called "glaring instance" of the fallacy of the old theory, suggested another source of cardiac hypertrophy outside the kidney, and this was found in the condition of the systematic arterioles and capillaries.

These were found in such cases to have undergone various changes. The intima was thickened; the adventitia thickened, and often not to

<sup>1</sup> Dr. Stevenson, Professor of Chemistry, Guy's Hospital.

be distinguished from the surrounding connective tissue, the smaller vessels being matted into the connective tissue by a fibroid, felt-like hyaline substance; the muscular coat was also variously altered.

Even where apparently normal, the nuclei of the muscle-cells did not absorb coloring matter so readily as in healthy vessels. This layer often seemed relatively increased, and might, in some cases, have been actually hypertrophied. But more often, even with the increased thickness, there was a morbid change in the muscle-cells; the nuclei were becoming spindle-shaped or atrophied, or reduced to small globular bodies, having a high refraction like fat.

We summarized our investigations as follows:

(1) Kidneys often much contracted; heart much hypertrophied; minute arteries and capillaries proportionately thickened by "hyaline-fibroid" formation.

(2) Kidneys little contracted, but heart much hypertrophied; minute arteries and capillaries much thickened by "hyaline-fibroid" substance.

(3) Kidneys healthy, whilst heart much hypertrophied, and minute arteries and capillaries much thickened by "hyaline-fibroid substance."

It is universally admitted that about the middle period of life vascular changes in the brain may prove fatal from hemorrhage and the like, with extreme hypertrophy of the left ventricle of the heart, and on the post-mortem table the kidneys may show but little change, often no more than early granulation with adherent capsules. Yet hitherto no one has referred the cardiac hypertrophy in these cases to defective renal function. In fact, generally, the post-mortem record has run thus: "Left ventricle much thickened, kidneys but little affected."

Two fallacies have hitherto beset an open inquiry into this form of renal pathology. The one, that where the renal changes are marked, all the attendant systemic changes have been, without reserve or limit, vaguely referred to the kidney as their source. The other, that though in a given case the systemic changes may have been of a similar character to those in the former case, yet if the kidney changes were not marked no relation was suspected between the two sets of conditions. The assumption that the fibroid change in the kidney, of the form of which I am now speaking, has a local origin, appears to us to have prevented an impartial study of all the circumstances of its origin and course and complications.

It is still widely assumed that this renal change has a more or less acute beginning in inflammation.

Now, although, obviously, the kidney at any period of life, and more commonly if the health be weakened, may become the seat of inflammation, the *fibroid change in question is not inflammatory*. There is no acute stage, no acute hyperæmia; there is no diapedesis of leucocytes and



blood cells characterizing ordinary inflammation; no local or general symptoms indicating nephritis, as a necessary part of the process.

The first abnormal departure from health as regards the kidney function may be no more than a diuresis, the urine at that time presenting no morbid character, except a somewhat lower specific gravity; there are no deposits in it of any inflammatory ecdysis, no casts, no leucocytes, no epithelium. But coincidently with this early stage, and often even preceding it, there may be for months or years marked systemic changes throughout the body, viz., loss of weight, loss of color—the complexion becoming grayish—symptoms of failing nutrition in different organs, varying in different individuals, skin less elastic, changes in brain power or spinal power, dyspepsia, shortness of breath, and signs of cardiac hypertrophy.

This train of events may go on in a vague way from month to month, without any recognized pathological basis, until albumen is found in the urine, and then, according to current views, the case is called “Bright’s disease,” and no further investigation seems required. Yet at this very stage, where all investigation has hitherto stopped, we believe that the *Lucina* of science should rather have been invoked than an *Atropos* to cut short inquiry. A more lucid pathology would have combined the whole facts into one state, the organism being affected throughout, at least in the vascular area. Instead of combining the thickened heart and the contracted kidney together directly, the whole man should have been placed between the two, as their proper nexus.

That this renal change is not inflammatory is now generally admitted by English pathologists. Dr. Greenfield, Professor of Pathology at Edinburgh, thinks it an atrophic process.<sup>1</sup>

“The primary or earliest change,” he says, “is a fibroid change in the arterial walls, which especially affects the afferent arterioles” (of the Malpighian tufts). “Further,” he adds, “if we carefully inquire into the history and the renal changes, we find that at least two forms of disease are grouped under this common name of renal cirrhosis, the one essentially of a chronic inflammatory nature, the other due to an atrophic process dependent on a primary arterial degeneration. It is true that we find these two forms intermingled in some cases, but in others they appear absolutely distinct. In the chronic atrophic form the primary change is a chronic periarterial and endoarterial fibrous thickening. Strictly speaking, this is not an interstitial nephritis at all, though some intercurrent inflammation may occur.”

Although these quotations set forth the most recent views of one of our best pathologists in respect of the local changes in the fibroid kid-

<sup>1</sup> “Discussion on Albuminuria,” Glasgow Pathological and Clinical Society, p. 71.

ney, I have no authority for adducing them as evidence on his part of their relation to similar systemic vascular changes in other organs, although, from our point of view, they have the most direct relation thereto.

Another, also, of our recent writers,<sup>1</sup> and one who contends for the unity of renal diseases, seems to imply from his writing that this fibroid change is the result of "nuclear proliferation;" a process which extends through the whole structures of the kidney, and into the tubules; an "inflammatory process, of prolonged duration, but of *minimum intensity*." Describing the changes in the vessels, he writes: "The internal elastic lamina is swollen, its layers are separated and interspersed with nuclei; within is the much thickened endothelial layer converted into a delicate fibrous tissue, outside the elastic lamina is the muscularis, showing widely separated spindle-shaped nuclei, and looking as if it were œdematous. Outside this again, is a cellular connective tissue, in which no adventitial coat can be distinguished from the surrounding connective tissue."

Speaking of the connective tissue, he says:

"The changes in the capsule of the Malpighian bodies, the adventitial tunics of the vessels, and the basement membranes of the tubes, consist mainly in swelling and hyaline transformation."

He regards the process as of an essentially chronic nature, the changes which take place partaking more of the character of growth than of inflammation."

It may be of interest to remark that the descriptions here given by independent observers of the changes of the renal textures in renal fibrosis, are precisely of the same character, and are expressed in words almost identical with those employed by ourselves in describing associated changes in other organs.

In describing,<sup>2</sup> for instance, a section of the cord from the lumbar region of a man aged forty-seven, with granular contracted kidney and cardiac hypertrophy, the terms used are "vessels thickened by hyaline layers." "Thickened connective tissue, nuclei multiplied." "Arterioles much thickened, nuclei of their intima multiplied (nuclear proliferation)." "Kidney slightly granular, lungs emphysematous, heart healthy, vessels thickened by fibroid material."

Indeed, throughout the paper in which we have described fibroid changes in the vessels of the cord and their surroundings, we have been able to demonstrate *vascular changes of precisely the same character as those that occur in the fibroid kidney*.

"In the spinal cord, as in the kidney, the fibroid change is most marked where the connective tissue is most abundant, extending in cord

<sup>1</sup> Saundby.

<sup>2</sup> Pathological Transactions, vol. xxviii, 1867.

and in kidney from the adventitia of the arterioles and capillaries into surrounding connective tissue."

The fibroid material in the cord, as in the kidney, contracts and compresses surrounding tubules, causing their atrophy or destroying them; but leaving many adjacent tubules comparatively normal. In the cord, as in the kidney, it would seem that acute change frequently supervenes on the chronic.

Seeing that so many tubules remain comparatively normal, we are enabled to understand how it is that both cord and kidney may retain much of their functional activity, even when the seat of very extensive fibroid change. Of the five cases which formed the subject of this communication respecting arterio-capillary fibroid changes in the spinal cord, in two the kidneys were granular and contracted, left ventricle of the heart hypertrophied, no valvular disease. In one, kidney slightly granular, heart not hypertrophied; in two, kidneys not contracted or granular. In one of these the lungs were the seat of extensive fibroid induration; in the other, brain atrophied, great cardiac hypertrophy.

These particulars show that *fibrosis in the cord may occur coincidentally with fibrosis of the kidney, or may be in advance of the fibroid change in the kidney, or may occur independently of renal disease.*

It may assist us toward a better criticism of our present position if we for a moment recall the steps which have led to it.

In Bright's time the morbid changes in the kidney, whatever their nature, so long as they were characterized by the presence of albumen during life, occupied the whole field of clinical thought. The hypertrophied heart and thickened bloodvessels were supposed to be conservative; the one for forcing the impure blood through the tissues, and the other for preventing it. The mere statement now looks almost absurd. It soon became obvious that in a very large class of renal diseases there are no such changes in the heart and bloodvessels; but, on the contrary, death occurs from an enfeebled circulation, anæmic, œdematous textures, uræmia, and exhaustion. And further, that in what was called by the older physicians the climacteric period of life, from the sixth to the ninth septenniad, the heart, the brain, the cord, the lungs, the skin, the kidneys, and other organs, become liable to degenerative changes in the lines of their arterioles and capillaries—and in the course of the *interstitial* circulation of the plasma from them, without acute beginnings in any organ, but often with acute intercurrent inflammation.

The heart, despite its liability to these degenerative changes, like other parts, still exhibits a residual force of nutrition, in the multiplication of its contractile elements (hypertrophy), as might have been anticipated from its earliest relation to the organism.

These degenerative changes falling upon the vascular areas in all parts would, no doubt, if life could be continued, extinguish the heart

itself; but in the earlier stages there is hypertrophy to meet the systemic difficulty—not, we believe, to meet the defect of the renal function, pure and simple, to push on, as it is said, the impure blood, but to meet the loss of arterio-capillary elasticity, and the hindrance to the flow of plasma through the tissues.

Whilst we can no longer, in one large class of cases, refer the arterio-capillary changes in the various organs, including the kidney itself, to the kidney as the primary seat of disease, and to the consequent uræmia, it is still a question how far a local fibroid change beginning in the kidney, and having its origin there, may lead to systemic arterio-capillary changes of the same character as those which come on idiopathically in later life.

For the present, I am content to leave this matter for future inquiry.

It is admitted that granular contracted kidney is rare in the early periods of life. It is also admitted that the kidney may be extremely atrophied by fibroid changes in it of a local kind, in young subjects, and that such changes may be fatal by unexpected uræmia without cardio-vascular change.

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## REPORT OF A CASE OF INTESTINAL OBSTRUCTION, SUCCESSFULLY TREATED BY LAPAROTOMY;

WITH REMARKS UPON THE TREATMENT OF ACUTE INTESTINAL OBSTRUCTION.

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THAT obstruction of the bowels with its attendant evils is not an infrequent occurrence, will be admitted by all who have given attention to the subject. That it is a serious and usually fatal affection cannot be denied. The term itself is used to denote a series of morbid conditions, which in many cases have only this symptom in common, whilst in other respects they are almost as widely separated as are the various conditions which give origin to the common symptom of pain.

During the past year much has been written, especially in England, about the treatment of this class of cases, and there is still a great diversity of opinion in regard to the matter. Mr. Jonathan Hutchinson decidedly opposes early interference in cases of intestinal obstruction, and thinks it of but little value in those which have been some time in existence. He advocates what he terms abdominal taxis, under an anæsthetic. By abdominal taxis, he means a thorough kneading of the abdomen, with inversion of the patient, shaking him, tossing him in a blanket, and a



variety of rough gymnastics, the object being to dislodge the bowel, or untwist the volvulus. At the same time, he uses large enemata and laxative medicines. If these means do not succeed, he waits and keeps the patient on a low diet, and gives opium or belladonna internally, and subsequently repeats the abdominal taxis. He reports a series of interesting cases in which a cure was effected by these means. He favors laparotomy as a last and most desperate resort.

Mr. Frederick Treves, and many others, take the opposite side of the question; considering the conditions which produce acute obstruction to be, for the most part, of a necessarily fatal character unless speedily relieved, they do not waste time in what they regard as useless, if not injurious, manipulations, and proceed to open the belly as soon as assured that the case is one of serious obstruction and not of obstinate constipation.

Every one concedes that an accurate differential diagnosis is in many cases impossible in the present state of our knowledge, and that it is in the highest degree important to perfect our powers of diagnosis. The opinion of so eminent a surgeon as Mr. Hutchinson must always command respect, and the report of his cases treated by abdominal taxis deserves most careful consideration; and yet I think that few practical surgeons would be willing to adopt his line of treatment. It seems to me to be a very hazardous procedure, strongly to knead the intestines and to shake and jerk a patient with a strangulated bowel about in a way that is unpleasant and painful to a well person, and that, too, in a case in which the diagnosis has not been accurately determined. It is in the highest degree probable that the patient would be injured and not benefited in a large number of cases. Suppose an internal hernia, a tight constriction of some portion of the intestinal tract, is present, and has already been in existence for days, any rough handling may cause perforation of the gut and extravasation of feces; or the prolapse may be increased instead of diminished; or the intussusception may be violently drawn out, tearing conservative adhesions; or the volvulus increased. Who would think of roughly manipulating a femoral, or any other strangulated hernia? Who would delay resorting to herniotomy, if, after very gentle taxis, fecal vomiting or other symptoms of strangulation continued? It is true that invaginated bowels sometimes are released, either by spontaneous reduction or by sloughing of the invaginated portion; volvuli are sometimes untwisted, and internal herniæ are relieved either by being reduced, or by adhesion to the abdominal walls and the formation of an artificial anus, but such methods of cure are extraordinary and are not to be expected.

Volvulus and intussusception offer the most favorable conditions for recovery, and they are attended with a very large mortality; but in the case of internal constrictions from adhesions or bands, whether from congenital defects or pathological changes, a cure by the process of

nature is of such rarity that it ought not to come into consideration, and the patient unless relieved by art is almost inevitably doomed to death. Unfortunately, it is not possible to reach a certain diagnosis in all cases, but this very difficulty is one of the strongest arguments in favor of opening the abdomen, both as a diagnostic and a curative measure. I certainly think severe pain, obstinate constipation, and stercoraceous vomit are a congeries of symptoms of sufficient gravity not only to justify, but to demand imperatively, the performance of laparotomy.

Six years ago a case of intestinal obstruction, probably from volvulus, or possibly from an impacted gall-stone, came under the care of the writer, which was relieved by medical means; the benefit lasted, however, but a short time, when symptoms of obstruction again set in, and only terminated with the life of the patient. I proposed an operation, but was overruled by the consulting surgeon. This case made a deep impression upon my mind, and I determined not to let a similar case die in my hands, without at least offering the patient the chance of relief by laparotomy or colotomy.

Another case which died from obstruction, the autopsy of which I was invited to perform, showed how slight may be the constriction which is sufficient to produce fatal strangulation of the bowel. It was that of a young child who died after an illness lasting several days, in which vomiting and insuperable obstipation were the main symptoms. The autopsy revealed an internal hernia of a portion of small intestine, which had become strangulated by passing under a small band of tissue not thicker than a few strands of horsehair. This band was attached by both ends to a portion of intestine, thus forming a free loop, through which the hernia occurred. It seemed to me to have been of congenital origin, as there was no other sign of peritonitis. The division of this band in time, would probably have saved the life of the little patient. A case presenting many similar features was successfully operated on by Mr. R. N. Pughe, of Liverpool. Several other cases are mentioned in recent journalistic literature, in which very slight bands or adhesions were the cause of strangulation.

The importance of an early recognition of intestinal obstruction cannot be overestimated, and with its recognition comes the duty of being prepared to give the patient every possible chance for recovery. These cases come when least expected, and demand prompt attention, and usually not much time is allowed the practitioner for consultation or reference. He must often act upon his own responsibility, promptly and boldly, or the golden opportunity will be lost.

Within a few weeks of each other there have occurred three cases of intestinal obstruction in the practice of gentlemen connected with the University of Maryland. One case was due to the adhesion of a loop of intestine to the pedicle of an ovarian tumor, which had been success-

fully removed some weeks previously. Another was due to the strangulation of a small portion of gut in the femoral ring, which produced no symptoms by which the seat of constriction could be located before opening the abdomen. Laparotomy was performed, the incarcerated intestine released, and the patient recovered. The other case occurred in my own practice.

It is only by accumulating facts bearing upon the results of treatment that an approximate idea can be formed of the comparative value of different therapeutical procedures, whether medicinal or operative; and, in order to contribute my mite to the elucidation of the subject under discussion, I desire to place upon record the following case:

CASE.—M. E. B., colored, aged twenty-two years, unmarried, but the mother of two children; has been generally healthy. Four years ago, according to her own account, she suffered from *proclivitas uteri*, and, since she has had children, from “womb disease.” She gives no history of having had pelvic cellulitis or peritonitis. She had suffered from constipation for several days, with pain in the abdomen, and occasional vomiting. She took purgatives—oil and salts—without effect, and sent for me on December 6, 1885.

I visited her about 10 P. M., and found her rolling over the bed in agony. Her bowels had not been moved for five days, and she had vomited twice on the day on which I saw her. The patient is slenderly built, the abdomen moderately distended and somewhat painful upon pressure. She complains of pain above the umbilicus more than anywhere else. When in a paroxysm of pain, the coils of intestines can be seen outlined upon the abdomen, and they can be felt moving under the hand. She had what appeared to be a small, reducible, inguinal hernia on the left side, which reappeared soon after being reduced. She had no pain or other symptoms of strangulation at any of the abdominal rings. There had been no fecal vomiting. I administered gr. one-third morph. hypodermatically, and ordered castor oil  $\mathfrak{z}\text{j}$ , oil of turpentine  $\mathfrak{z}\text{j}$ , a nauseous but very effective combination, to be followed by one grain of calomel every hour.

*Dec. 7.* The oil has had no effect, and was, some time subsequent to its administration, returned with the vomit. Six grains of calomel having been taken, it was discontinued. She had a pretty good night in consequence of the hypodermatic injection. She is in good condition, and is comparatively free from pain; pulse 80–90, temperature  $98\frac{1}{2}^{\circ}$ . Having placed the patient in the genupectoral position, I introduced a flexible tube twelve to fifteen inches up the bowel and administered copious injections of warm water, which were returned almost unstained. Epsom salts and fluid extract of senna were ordered in small doses, which had the effect of increasing the peristalsis of the bowel with additional pain. Seeing that obstruction and not impaction of feces was present, I discontinued all medicine internally, and gave a full dose of morphia hypodermatically. Vaginal examination revealed nothing in regard to the nature of the obstruction.

*8th.* 10 A. M., condition unchanged, and I decided to operate. At 2 P. M. I availed myself of the opinion of my friend Prof. Michael, who coincided with me in regard to the propriety of an operation. The pa-



tient, in the interval between my visits, had vomited matter which, in appearance and odor, indicated feces. All preparation had been made during the morning for laparotomy. The belly had been well washed with soap and water, and afterward a cloth, moistened with hot bichloride of mercury solution, was laid upon it; instruments and hands disinfected with bichloride solution, and afterward kept moistened with a mildly carbolized lotion; all the water used had been boiled, and was kept in a tin boiler on a stove in the room, so that we might have an abundant supply of hot water; sponges and sutures had been in sublimate solution for months; hot boiled water, slightly carbolized, was used for the sponges and flannels during the operation. I operated in the bedroom of the patient, which was small and ill ventilated, and its appearance did not suggest a state of very rigid antisepticism. I was kindly and efficiently assisted by Drs. Michael, Chunn, and Gertrude Scott, for whose intelligent aid I am under many obligations.

This incision was in the linea alba, midway between the umbilicus and pubes and at first about two inches in length, subsequently lengthened to six inches. Bleeding was arrested before the peritoneum was opened. Coils of small intestine presented in the wound, which were reddened and distended but smooth and glistening. The abdominal rings were first explored. On the left side an apparant hernia was present which could not be reduced. External pressure caused the protrusion to bulge into the abdominal cavity, but did not expel its contents, whilst something was interposed between the ring and the finger which was mistaken for adherent intestine. As it could not be reduced from within, herniotomy was performed in the groin, and a sac was encountered, which when opened gave exit to serous fluid, but no intestine was found, and the finger could not be passed through the canal into the abdomen. This was either a cured hernia, or, as suggested by Dr. Michael, a hydrocele of the round ligament.

The obstruction not being found at any of the rings, the incision was enlarged upward to the navel. The intestines were covered with flannels wrung out of hot carbolized water. The abdominal cavity was now explored with the hand, beginning at the cæcum, but without finding any obstruction. The small intestines were now drawn out and wrapped in hot cloths; after a large portion of the small intestine had been removed from the abdominal cavity, a loop of ileum was found dipping into the pelvis, which was firmly attached between the uterus and rectum, and neither the descending nor ascending portion of the loop could be moved. The intestine appeared to be firmly and evenly attached to the pelvic wall, without any gaps or openings in which I could begin its separation; finally, loosening of the adhesions was effected, and the bowel was gradually released with the finger. After two distinct lines of adhesion had been broken up, the loop of deeply congested gut was lifted out of the pelvis, and the adhesions were found to have involved a space about six inches in length, the seat of greatest constriction having been about six or eight inches from the ileo-cæcal valve. At this point the bowel had been sharply bent upon itself, and above the bend the intestines were distended, while below it they were collapsed. In separating the gut, its peritoneal coat was torn off in several places, and its muscular coat exposed. In one place five Lembert sutures were inserted, as the intestinal wall looked weak.



The abdominal and pelvic cavities were carefully cleansed and the wounds closed. The abdominal incision was closed with five or six strong sutures passing through the entire abdominal walls, but before tying these deep sutures the peritoneum was united separately with a continuous catgut suture. A number of stitches passing through the tissues external to the peritoneum were then inserted, and subsequently the edges of the skin were secured with a continuous suture of fine silk. Iodoform powder was freely dusted on and around the incision, several thicknesses of iodoform gauze were laid over this, then eight layers of plain gauze and over all a protective. Whilst I was closing the abdominal incision Dr. Michael was kind enough to close the inguinal wound, using the continuous catgut suture, and several strands of catgut instead of a drainage tube. Iodoform in powder, gauze, mackintosh, spica bandage and bandage around the belly completed the dressings, the whole operation lasting over an hour.

During the operation the patient had unmistakable stercoraceous vomiting, and whilst handling the intestines the pulse increased in frequency. At the conclusion of the operation, her pulse was rapid but good, and the shock was not marked. She was placed in bed, bottles of hot water applied to her skin, and a small quantity of whiskey administered hypodermatically.

Whilst searching the abdominal cavity for the seat of obstruction, I made an observation which may have considerable diagnostic and prognostic value. I discovered by the sense of touch, that the mesenteric glands were markedly enlarged, hence I am led to anticipate a general tuberculosis at some future time.

At 7 P. M. reaction was found to be complete, the skin warm, the patient conscious and nearly free from pain. I drew the urine, which was normal in appearance and small in quantity.

At 10 P. M. pulse 124 in frequency and good in character, temp.  $99\frac{3}{4}^{\circ}$ , resp. 22. She is very comfortable and hopeful, has had no vomiting and scarcely any pain, gave ten minims Magendie's solution, hypodermatically. Allowed her to have cracked ice, and one teaspoonful of milk every hour, as she had had no food for a week. Ordered her to keep the supine position without moving. Dec. 9th, 9 A. M., patient looks well, slept well during the night, has had no vomiting, and very little pain, is very hungry, urinates freely, tongue clean, lies with the legs stretched out, and the belly is not tender upon pressure, except over the wound. Pulse 123, temp.  $99\frac{3}{4}^{\circ}$ , resp. 22. Milk to be given every half hour in tablespoonful doses and an equal quantity of water if she desires it. P. M., condition unchanged, has passed flatus *per anum*, pulse 128, temp.  $100\frac{3}{4}^{\circ}$ , resp. 20. Allowed to have two tablespoonfuls of milk every half hour, as she is ravenously hungry.

The further history is uneventful. The pulse on the second day fell to about 100 beats in the minute, and the temperature remained below  $100^{\circ}$  F. On the fourth day a large, consistent, feculent passage was voided after an enema of soapsuds. She was kept on a restricted diet of milk, with a few dry crackers, for the first week. On the ninth day the dressings were opened for the first time, and the deep sutures removed; but as the edges of the skin were not quite healed, the superficial continuous suture was allowed to remain three days longer. Not one drop of pus was seen anywhere. The wound in the groin, which was sutured

with catgut, healed firmly everywhere under one dressing, and did not require to be dressed again. She was discharged cured on December 26th.

## DAILY RECORD OF VITAL PHENOMENA.

Date.	A. M.			P. M.		
	Pulse.	Temp.	Resp.	Pulse.	Temp.	Resp.
Dec. 8	....	....	....	124	99 $\frac{2}{5}$	22
" 9	123	99 $\frac{3}{5}$	22	128	100 $\frac{3}{5}$	20
" 10	114	99 $\frac{4}{5}$	22	97	99 $\frac{3}{5}$	20
" 11	99	99 $\frac{2}{5}$	22	102	99 $\frac{3}{5}$	
" 12	100	99 $\frac{2}{5}$	20	99	99 $\frac{1}{5}$	20
" 13	102	99 $\frac{3}{5}$	18	105	99 $\frac{2}{5}$	18
" 14	101	99 $\frac{3}{10}$	21	105	99 $\frac{1}{2}$	22
" 15	103	99 $\frac{1}{5}$	21	100	99 $\frac{1}{5}$	21
" 16	100	99 $\frac{1}{5}$	20			
" 18	104	99 $\frac{1}{5}$				
" 19	....	98 $\frac{3}{5}$				
" 21	90	98 $\frac{3}{5}$	22			

Several facts in the above history deserve more than a mere mention. One of the most noticeable features was the absolute cessation of nausea and vomiting after the operation; from the time she vomited stercoraceous matter whilst under ether, she had neither nausea, straining, nor vomiting. Pain ceased almost as suddenly, and with the exception of a certain amount of smarting in the incision, she was entirely comfortable. Hunger was experienced almost immediately, but was not gratified. During the first twelve hours, only a teaspoonful of milk every hour was allowed, with cracked ice. After the first twenty-four hours a tablespoonful of milk every half hour, which was increased to two tablespoonfuls on the second day; subsequently three or four dry crackers were added, and after the first week a more generous diet. No medicine was given except two hypodermatic injections of morphine within the first twenty-four hours.

The escape of flatus on the second day, and of feces on the fourth, gave evidence that the constriction and paralysis of the bowel had been overcome, and that it was capable of resuming its functions. From the deeply congested appearance of the bowel, it was the opinion of those present, that she would not have lived forty-eight hours longer. Peritonitis had not, however, actually set in, as there was neither serum nor lymph found within the abdominal cavity.

The next time I have occasion to open the belly, I will modify the suture used in this case, to this extent, viz., suturing of the peritoneum will be done separately with continuous catgut; I shall then pass deep silk sutures through the abdominal walls, external to the peritoneum, as this will tend to prevent pus from finding an entrance into the cavity, should any form.

Two methods of treatment of intestinal obstruction remain to be mentioned. The first consists in washing out the stomach, and thereby producing mechanical vomiting, and emptying the intestines of gas and feces. This method is highly recommended by Kussmaul, and deserves a trial in appropriate cases, as it appears to be harmless. The other method is that so highly lauded by Illoyay in the last number of this journal (Jan. 1886)—the forcible distention of the bowel with water under strong pressure. It is well known that water can be forced through the ileo-cæcal valve by simply inverting the patient, and using a Davidson's syringe. My friend, Dr. John Morris, of this city, relates a case in which, under these circumstances, water was seen to escape from the mouth in jets synchronous with the squeezing of the bulb of the syringe. I think that the degree of force just indicated is as great as should be used in administering enemata; hence I regard the injections under strong mechanical pressure as very dangerous, perhaps as much so as Mr. Hutchinson's abdominal taxis.

In conclusion, I wish to express my opinion decidedly against any and all severe methods of attempting to overcome the obstruction whether by rough manipulations, or by rectal injections under strong pressure. On the other hand, I deprecate resorting to operation until a fair trial of medical means has failed to relieve the condition, and until it is reasonably certain that there is some mechanical hindrance to the passage of the feces, which will terminate fatally unless relieved by operation. For obstruction in the large intestine colotomy would in many cases afford relief. For persistent obstruction of the small intestine, my preference is decidedly in favor of laparotomy in the linea alba below the umbilicus, under rigid antiseptic precautions, as being the most precise, scientific, and rational means of discovering the cause and seat of trouble, and of remedying it at the same time. Whilst I am not one of those who underrate the risks of laparotomy, I do not think an exploratory incision to be a more serious procedure than abdominal taxis, or enemata under heavy pressure, and I do think it much more certain and reliable in its results.

1 MOUNT ROYAL TERRACE, BALTIMORE,  
January 12, 1886.

## ON RIGHT-SIDED ENDOCARDITIS.

BY BYROM BRAMWELL, M.D., F.R.C.P. (EDIN.),

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In the following paper I propose to record my experience with regard to the frequency of right-sided endocarditis; and, in a subsequent paper, to direct attention to the pathological features of the cases of ulcerative endocarditis which have occurred in the Edinburgh Royal Infirmary during the past three years.

## RIGHT-SIDED ENDOCARDITIS.

Almost all authorities are agreed in stating that right-sided endocarditis is rare. Bristowe, for example (than whom no more trustworthy or judicious observer could be quoted), says: "In the great majority of cases endocarditis is limited to the left side of the heart." Sibson examined the whole of the cases of valvular and other diseases of the heart, and of Bright's disease, contained in the post-mortem records of St. Mary's Hospital, from 1851 to 1869-70, with the special object of ascertaining the frequency, extent, and character of any affection of the tricuspid valve that might occur in those cases, the result being that he could find only two cases in which the tricuspid was affected with recent endocarditis, one case in which a large concretion was attached to the tricuspid valve, and three cases in which there was distinct evidence of former endocarditis, as shown by contraction of the valvular orifice or thickening, corrugation, and roughening of the valvular segments. "These," he says, "are the only cases that permit definite evidence that in them the tricuspid valve had been previously affected with endocarditis. There were eighteen other cases in which there was some thickening of the tricuspid valve, in two of which it was stated to be atheromatous; but in none of these cases did it appear that the tricuspid valve was incompetent. Twelve of these cases had aortic, mitral, or mitral-aortic regurgitation, or mitral obstruction; and of the remaining six cases that were free from valvular disease, five had Bright's disease. "It does not appear to me," he adds, "that any of the cases present definite evidence of the previous existence of endocarditis of the tricuspid valve as the causes of the thickening of the flaps, although it is probable that in some of them the valve had been originally influenced, and especially in those that presented aortic, mitral, or mitral-aortic regurgita-

<sup>1</sup> The Theory and Practice of Medicine, by John Syer Bristowe, fifth edition, p. 515.



tion, or mitral obstruction. Endocarditis and structural disease of the tricuspid valve are," he states, "admitted to be so rare in the adult, that there are few clinical or pathological records describing affections of that valve."<sup>1</sup>

Sperling (quoted by Rosenstein<sup>2</sup>) found out of 300 cases of endocarditis, 297 in the left side and 32 in the right (or nearly 11 per cent.); confined to the left side alone 268, and confined to the right side alone 3, and simultaneously in both 29. . . . With a view to express the relative frequency with which the affection attacks the different valves, Sperling tabulated Virchow's material, and out of 300 cases of endocarditis he found it 255 times on the mitral, 129 on the aortic valves, 29 on the tricuspid, and 3 times on the pulmonary. In 157 cases the mitral alone was affected, in 40 the aortic valves alone, and the tricuspid alone in 3 cases, while the valves of the pulmonary artery were not the only affected parts in a single case.

Sansom's results are very different. He examined the post-mortem records of 68 cases of valvular disease at the London Hospital, and found that the stage of recent endocarditis was present in 9 cases, or about 13 per cent.; in 3 of the cases the tricuspid valve was involved; in other words, the tricuspid was involved in 33 per cent. of the cases in which evidence of recent endocarditis was present in the heart.

My own conclusions are based on an analysis of all the cases which were examined post-mortem in the Edinburgh Royal Infirmary during the three years that I held the office of pathologist to the institution.

The *total number of post-mortems* during this period, or, more precisely, from October 27, 1882, to November 16, 1885, was 685.

In this total of 685 cases the *same naked-eye lesion of the valvular apparatus of the heart* was found in 131 cases, or 19.12 per cent. This percentage does not exactly or fully represent the total amount of cardiac disease which was present in the 685 patients during life, for (*a*) in a considerable number of cases the written permission of the friends or relatives, without which no post-mortem can take place in the Edinburgh Royal Infirmary, did not include the thorax, and the condition of the heart was consequently not ascertained; and (*b*) it takes no cognizance of cases of mitral and tricuspid regurgitation due to simple dilatation and to structural changes in the cardiac muscle (relative and muscular incompetence, as I term them), conditions which are very common during life, and which may be unattended with any naked-eye lesion of the valvular apparatus after death.

The proportion in which the different valves were affected, either alone or in combination, is seen in the following table.

<sup>1</sup> Russell Reynolds's System of Medicine, vol. iv pp. 523, 524, and 525.

<sup>2</sup> Ziemssen's Cyclopaedia of Medicine (American translation), vol. vi. p. 82.

TABLE I.—SHOWING THE PROPORTION IN WHICH THE DIFFERENT VALVES WERE AFFECTED IN THE 131 CASES IN WHICH THERE WAS SOME NAKED-EYE LESION OF THE VALVULAR APPARATUS OF THE HEART.

Valve.	Number of cases.	Percentage of 131 cases.
Aortic alone . . . . .	17	12.97
Mitral alone . . . . .	36	27.48
Tricuspid alone <sup>1</sup> . . . . .	6	4.58
Pulmonary alone . . . . .	0	0
Aortic and mitral . . . . .	34	25.95
Aortic and tricuspid . . . . .	1	0.76
Mitral and tricuspid . . . . .	16	12.29
Aortic, mitral, and tricuspid . . . . .	21	16.03
Total . . . . .	131	

THE RELATIVE NUMBER OF TIMES IN WHICH THE AORTIC, MITRAL, AND TRICUSPID VALVES WERE AFFECTED.—From this statement it will be seen that the *aortic valve* was affected, either alone or in combination, in 73 cases = 55.72 per cent.; the mitral in 107 cases = 81.67 per cent.; and the *tricuspid* in 44 cases = 33.58 per cent.

THE NATURE OF THE AORTIC, MITRAL, AND TRICUSPID LESIONS.—In 34 of the 131 cases in which there was a naked-eye lesion of the valvular apparatus, the lesion was not (or was not unmistakably) the result of endocarditis. Thus, of the 73 cases in which the *aortic valve* was affected, the lesion was apparently the result of endocarditis in 59; in 12 it seemed to be due to atheroma; while in 1 case it was classed as simple (non-inflammatory) thickening; and in 1 case it consisted of a hemorrhage beneath the endocardial covering of one of the valve segments.

Of the 107 cases in which the *mitral valve* was affected, the lesion appeared to have resulted from endocarditis in 82; of the remainder, 21 have been classed as simple (non-inflammatory) thickening; 3 were due to atheroma; and in 1 case the lesion was thought to be congenital.

Of the 44 cases in which the *tricuspid valve* was affected, 25 appeared to have resulted from endocarditis; while the remaining 19 have been classed as due to simple (non-inflammatory) thickening.

It is important to note that in this mode of classification the frequency of endocarditis is certainly underestimated, for in some of the 21 mitral and 19 tricuspid cases, classed as simple (non-inflammatory) thickening, the lesion was, without doubt, the result of former endocarditis. The error cannot, however, be avoided; for, in the absence of cicatricial contraction of the valve segments and valvular orifice, I

<sup>1</sup> In two cases in which the tricuspid is classed as being the only valve affected, there were probably other lesions which were not noted at the time of the examination, the hearts being sent unopened to the physicians under whose care the patients had been during life.

know of no means by which the thickening of the mitral and tricuspid segments, which has resulted from former endocarditis, can be distinguished from the thickening which has resulted from long-continued forcible closure of the valve segments—such a thickening, for example, as is so frequently seen in the tricuspid segments in cases of chronic bronchitis and emphysema.

Taking the whole 131 cases, irrespective of the individual valves, the frequency of the different forms of lesion was as follows :

TABLE II.—SHOWING THE FREQUENCY OF THE DIFFERENT FORMS OF LESION IN 131 CASES IN WHICH THE VALVULAR APPARATUS WAS AFFECTED.

Simple endocarditis (recent, as evidenced by the presence of vegetation)	28 <sup>1</sup>
Ulcerative endocarditis	14 <sup>2</sup>
Simple endocarditis (old)	55
Total (endocarditis)	— 97
Simple thickening (some the result of endocarditis)	22
Atheroma	12
Total cases	131

ANALYSIS OF THE CASES OF ENDOCARDITIS.—If we analyze the cases of endocarditis more minutely, we find:

(1) In 97 of the 131 cases, in which some naked-eye lesion of the valvular apparatus was present, the lesion was the result of endocarditis.

(2) In the 97 cases of undoubted endocarditis, the *aortic valve* was affected, either alone or in combination, in 59 cases = 60.82 per cent.; the *mitral* in 82 cases = 84.53 per cent.; and the *tricuspid* in 25 cases = 25.77 per cent.

(3) Deducting the cases of ulcerative endocarditis, which were 14 in number, and which will be separately considered afterward, there were 83 cases of simple endocarditis; in these 83 cases, the *aortic valve* was affected alone or in combination 45 times = 54.21 per cent.; the *mitral* 76 times = 91.56 per cent.; and the *tricuspid* 24 times = 28.91 per cent.

(4) In the total number of 83 cases of simple endocarditis, vegetations (or gelatinous swellings thought to be indicative of commencing endocarditis) were present in 28 cases, which have consequently been classed as recent. (In some of these cases the vegetations were evidently of some standing, and in many of them there was distinct evidence of old and chronic disease.)

<sup>1</sup> In some of these cases there was also evidence of chronic valve disease. I am unable to state the exact frequency with which old and recent endocarditis were combined, for in several cases the vegetations were firm and of some standing, and it was impossible in some cases of this kind to say whether the valvular thickenings and contractions which were associated with these firm vegetations, were of the same date or not.

<sup>2</sup> This number does not represent the total amount of old endocarditis, for in several of the cases classed as recent endocarditis (simple and ulcerative) there were also chronic valvular lesions.

In the 28 cases of recent, simple endocarditis, vegetations were found on the *aortic valve* 15 times = 18.07 per cent. of the total 83 cases of endocarditis, or 53.57 per cent. of the total 28 cases of recent endocarditis; on the *mitral valve* 18 times = 21.68 per cent. of the total 83 cases of simple endocarditis, or 64.28 per cent. of the 28 cases of recent, simple endocarditis (in 2 of these cases there were no vegetations, but only gelatinous swellings, thought to be indicative of commencing endocarditis); and on the *tricuspid valve* 14 times = 16.86 per cent. of the total 83 cases of simple endocarditis, or 50 per cent. of the 28 cases of recent, simple endocarditis (in 2 of these cases there was gelatinous swelling, thought to be indicative of commencing endocarditis, but no vegetations).

(5) Of the total number of 83 cases of simple endocarditis, the lesion has been classed as chronic in 55 cases; but, as I have previously remarked (see foot-note to Table II.), this does not represent the total amount of old endocarditis; for, amongst the 28 cases in which vegetations were present, and which have in consequence been classed as recent, there were several cases of chronic (old) valve disease.

In the total 83 cases of simple endocarditis, the *aortic valve* was unmistakably affected with chronic endocarditis in 30 cases = 36.14 per cent.; the *mitral* in 58 cases = 69.87 per cent.; and the *tricuspid* in 10 cases = 12.04 per cent.

(6) In the total 131 cases in which there was some naked-eye lesion of the valvular apparatus of the heart, there was evidence of recent or former pericarditis in 23 cases. In 15 of these cases there had been severe endopericarditis, the sac of the pericardium being obliterated by universal adhesions, and the valvular apparatus seriously implicated. In these 15 cases of severe endopericarditis, the *aortic valve* was affected with endocarditis in 10 cases = 66.66 per cent.; the *mitral* in 15 cases = 100 per cent.; and the *tricuspid* in 10 cases = 66.66 per cent.

SUMMARY OF THE PATHOLOGICAL EVIDENCE AS REGARDS THE TRICUSPID VALVE.—The foregoing pathological evidence may be summed up, with special reference to the implication of the tricuspid valve, as follows:

(a) Of 685 cases examined post-mortem, 131 presented some naked-eye lesion of the valvular apparatus of the heart; and of these 131, there were 44, or 33.58 per cent., in which the tricuspid was implicated.

(b) In 83 cases there was distinct evidence of old or recent endocarditis of the simple (non-ulcerative) form; and in these 83 cases, the tricuspid was affected in 24, or 28.91 per cent.

(c) Of the total 83 cases of simple endocarditis, there were 14, or 16.86 per cent., in which vegetations, or remains of vegetations, or gelatinous swellings thought to be indicative of commencing endocarditis, were found on the tricuspid valve, and which were consequently classed as



cases of recent (simple) endocarditis; while there were only 10, or 12.04 per cent., in which the tricuspid presented unmistakable evidences of former (old) endocarditis, as shown by cicatricial contraction of the valve segments and valvular orifice.

Further, there were 19 cases in which the segments of the tricuspid valve were simply thickened, but in which there was no cicatricial contraction; in some of these cases the thickening had probably resulted from former endocarditis.

(d) In 15 of the 83 cases of endocarditis, the heart had been affected with severe endopericarditis; and in these 15 cases of severe endopericarditis, the tricuspid presented evidences of endocarditis in 10 cases = 66.66 per cent.; the endocarditis being recent (as evidenced by the presence of vegetations) in 5 cases, or 33.33 per cent.; and old in 5 cases, or 33.33 per cent.

CONCLUSIONS DERIVED FROM PATHOLOGICAL EVIDENCE.—My pathological experience would therefore lead me to conclude:

*First*, that acute inflammation of the tricuspid valve is of frequent occurrence in cases of acute simple endocarditis, and that in severe cases of endopericarditis it is usually present.

*Secondly*, that chronic disease of the tricuspid valve the result of endocarditis (as evidenced by the presence of cicatricial contraction of the valve segments and valvular orifice) is of much less frequent occurrence.

*Thirdly*, that acute inflammation of the tricuspid valve in many cases subsides and is completely cured. The importance of this fact as bearing upon the prognosis and treatment of left-sided (mitral) endocarditis will be again referred to.

Further, if this conclusion as to the curability of tricuspid endocarditis be correct, it explains the undoubted fact that in those cases of severe endopericarditis in which the patient survives the acute attack for a considerable time, the tricuspid is often found to be healthy. It is only when the patient dies soon after an attack of severe endopericarditis (before, in short, sufficient time has elapsed for the cure of the tricuspid inflammation), that vegetations or the remains of vegetations on the tricuspid valve may be expected to be found.

THE NAKED-EYE CHARACTERS OF TRICUSPID ENDOCARDITIS.—It is necessary also to remember that inflammation of the tricuspid is, as a rule, much less severe than inflammation of the mitral, and that the evidences of inflammation are consequently much less distinct on the tricuspid than on the mitral valve. In this fact lies, I believe, the explanation of the discrepancy between my results and those of most other observers. In many cases, the vegetations are so small or the remains of vegetations—little, hard, glistening prominences, situated here and there on the line of contact of the auricular surface of the edge of the tricuspid valve—are so minute that they are easily missed unless care-

fully looked for; in some cases, however, the vegetations are so manifest as at once to attract attention.

MODE OF EXAMINING THE TRICUSPID VALVE.—In examining the tricuspid valve the cone-diameter should first be ascertained; the valvular ring should then be completely cut through, the auricle and ventricle being, as it were, thrown into one; the auricular surface of the valve should next be thoroughly washed, and the line of contact on the auricular surface—the seat of election for vegetations, as I am in the habit of terming it—carefully and minutely examined.

If these directions be carefully and methodically carried out, I feel confident that the evidences of acute tricuspid endocarditis—in the form of minute vegetations or the remains of vegetations—will be much more frequently found than has hitherto been the case. I am not, of course, so rash as to say that the high percentage which was present in my series of cases will be maintained in future observations, for the number of cases at my disposal is far too small to warrant any such sweeping generalization. It is quite possible that it may be too high—that it may be accidentally high. I can, however, say that there has been no straining of evidence in the cases I have observed. In every case the examination has been made publicly, and the appearances demonstrated to large bodies of students. Some of the specimens I still retain in my possession.

THE CLINICAL EVIDENCE IN FAVOR OF THE OCCURRENCE OF TRICUSPID ENDOCARDITIS.—Turning now to the clinical side of the question, let us see what evidence there is in support of the proposition which has just been advanced on pathological grounds, viz., “that right-sided endocarditis (tricuspid endocarditis) is of frequent occurrence.”

The discussion of this part of the subject is attended with difficulty, owing to the fact that physicians are not agreed as to the indications by which endocarditis may be recognized in the living subject. While all observers allow that mitral endocarditis is of frequent occurrence in rheumatic fever, there is by no means a general agreement as to the symptoms and physical signs which indicate its presence.

In my work on the *Diseases of the Heart* (p. 371, *et seq.*), I have discussed this question in great detail.

The following are the conclusions at which I arrived with regard to the value of a systolic mitral murmur as a sign of mitral endocarditis in acute rheumatism:

(1) That a systolic mitral murmur occurring in the early stages of a first attack of acute rheumatism, in a person free from previous valvular disease and not previously anæmic, shows that there is a rheumatic affection of the heart.

(2) That the mitral regurgitation may be due either to mechanical alterations in the valve segments, resulting from endocarditis, or to

muscular incompetence, the result of a rheumatic affection of the muscle of the heart, or to a combination of these two conditions.

(3) That although it is impossible in many cases to determine which of these conditions (valvulitis or muscular incompetence) is the exact cause of the regurgitation, the strong probability is that the endocardium is affected (even if the *immediate* cause of the mitral regurgitation is an acute rheumatic affection of the cardiac muscle with resulting relative or muscular incompetence). I would, therefore, regard a murmur of this description as very strong evidence of acute endocarditis.

(4) That in exceptional cases the murmur, in the early stages, is due to anæmia. In these cases there would probably be a history of well-marked anæmia; a basic systolic (pulmonary) murmur would also probably be present.

(5) That a mitral systolic murmur originating in the later stages of acute rheumatism may be due to a rheumatic inflammation of the heart (endocarditis or myocarditis), to anæmia, or to simple muscular relaxation, such as is met with in all fevers.

To these conclusions I still adhere. I would ask those who differ from them, first, to meet *seriatim* the facts and arguments which I have advanced in their support, which it would be entirely out of place to repeat here, and to give me an opportunity of meeting the facts and arguments which they think are opposed to my views; and, secondly, I would ask, if they do not admit that a systolic mitral murmur, occurring in the early stages of a first attack of acute rheumatism, in a person free from previous valvular disease and not previously anæmic, is indicative of mitral endocarditis, do they mean to affirm that mitral endocarditis is unattended by any symptoms and signs by which it can be recognized, or what are the symptoms and signs which they think indicative of its presence?

The same conclusions which have been advanced above as to the value of a mitral systolic murmur, may, I think, be arrived at in the case of a tricuspid systolic murmur as an indication of a rheumatic affection of the right heart. It is necessary, however, to point out that the relative and muscular forms of incompetence are much more easily established at the tricuspid than at the mitral orifice, and that for this reason a tricuspid systolic murmur cannot have the same value as a sign of right-sided endocarditis, as a mitral systolic murmur has of inflammation of the left heart. Still, a systolic tricuspid murmur is, I believe, the only sign by which right-sided endocarditis is, as a rule, manifested, and when it occurs in the early stages of the case, in a person who is not anæmic and whose heart was previously healthy, its value as evidence of tricuspid endocarditis is, I believe, very considerable.

Now, if this conclusion is correct, and if, as I have previously attempted to prove on pathological grounds, right-sided endocarditis is of



frequent occurrence, we ought to find a systolic tricuspid murmur frequently developed in the early stages of acute rheumatism. I regret that my own observations on this point are not sufficiently numerous to warrant any general conclusions being based upon them. For the past six years I have not enjoyed the advantage of wards in a hospital, and I have consequently been unable adequately to carry out this and the many other clinical researches which I have planned out and commenced.

Since, then, my own observations are not sufficiently numerous, I have had recourse to the observations of the late Dr. Sibson, which are the most elaborate and detailed with which I am acquainted, and which are the more valuable for my purpose, since they were made without any bias in favor of the point which I am attempting to prove.

In Table IV. in Russell Reynolds's *System of Medicine*, vol. iv. p. 462, Sibson records the form of valvular disease and the kind of murmurs which were present in 107 cases of acute rheumatism in which endocarditis was present without pericarditis. Analyzing this table I find:

(a) That in 13 out of the 107 cases, or 1 in 8, there was a murmur over the right ventricle from regurgitation, through the tricuspid valve, without a mitral murmur. "In nearly all of these cases there was a greater or less amount of general illness, and in one-third of these (4) there was pain in the region of the heart. A tricuspid murmur was present also in 2 cases in which endocarditis was probable, and in 2 that have been included with a little doubt among the cases of pericarditis" (p. 463).

(b) That "a tricuspid murmur was present over the right ventricle in one-half, or 27 in 50, of the cases with recent mitral murmur. In 7 of these 27 cases, the presence of a tricuspid murmur was somewhat doubtful" (p. 463).

(c) A tricuspid murmur was present over the right ventricle in one-half, or 5 in 10, of the cases with a recent diastolic murmur (see p. 494).

(d) A tricuspid murmur was present in 2 or 3 of the 9 cases of combined aortic and mitral murmur of recent origin; and (e) in 5 of the 22 cases in which endocarditis was superadded to old valvular disease.

A tricuspid murmur was therefore present in 51 or 52 of the 107 cases of acute endocarditis recorded in this table, or in 47 or 48 per cent.

Further, it will be seen by reference to the more detailed account which Sibson afterward gives of these cases, that in a large proportion of them the tricuspid murmur was developed at an early stage of the disease, even before the mitral or aortic murmurs with which it was generally associated. "The tricuspid murmur," he says, "was present at the time of admission, or on the second day, in two-thirds of the cases (19 in 27) in which there were both a tricuspid and a mitral murmur" (p. 466).



Now what is the value of this murmur as an indication of right-sided (tricuspid) endocarditis? Sibson, who, be it remembered, is a very strong supporter of the view that a mitral systolic murmur occurring in the early stages of acute rheumatism is indicative of endocarditis of the left heart and mitral valve, concludes that a tricuspid murmur is not a sign of inflammation of the right side of the heart and of the tricuspid valve, but of inflammation of the left side of the heart and of the mitral valve. "When," he says, "the left ventricle is weakened by that inflammation, it sends less blood into the vessels of the system, and an undue amount of blood, therefore, accumulates in the vessels of the lungs—the pulmonary artery is overfilled, and the left ventricle is distended. The 'safety valve' function of the tricuspid is then brought into play, regurgitation takes place, and, by throwing a portion of the blood backward upon the veins of the system, it lessens the pressure of the blood upon the arteries of the lungs. . . . Tricuspid regurgitation, then, while it declares the presence of inflammation of the left ventricle and the mitral valve, relieves the congestion of the lungs, which is one of the worst effects of that inflammation. . . . A tricuspid murmur, then, is a friendly sign; it warns you of inflammation elsewhere, and relieves the ill effects of that inflammation. It is a danger signal and a brake, lessening the mischief" (p. 490).

With this opinion, which has been very largely accepted and quoted, I cannot altogether agree. Let us look at the facts and arguments with which Sibson supports it, and the facts and arguments which can be advanced against it.

Sibson says:

"The presence of this murmur in these cases over the right ventricle in the early stages of endocarditis, and that, too, when no other murmur prevails, naturally suggests to the mind at first sight that it is due to endocarditis affecting the right ventricle and the tricuspid valve. This inference is, however, forbidden by the following considerations:

(1) "*Endocarditis, and disease the result of endocarditis of the tricuspid valve, are very rarely discovered on dissection in those who have died from rheumatic inflammation of the interior of the heart or from valvular disease the effect of such inflammation.*"

Against this I advance the pathological evidence brought forward at the beginning of this paper; and say that, if that evidence is correct, this argument necessarily falls to the ground.

(2) "*The tricuspid murmur, when uncomplicated with disease of the mitral valve, was not established in any of my cases, but had either ceased altogether, or was steadily declining on the recovery of the patient.*"

This argument only shows that the pathological condition which is the cause of the tricuspid murmur usually passes off and does not result in the production of organic disease. But this is exactly what I claim usually happens in cases of right-sided endocarditis. Even in severe

cases of endopericarditis, the tricuspid inflammation is, as a rule, slight, and seldom leads to much permanent alteration of the valvular orifice. When, then, the tricuspid inflammation (as evidenced by the tricuspid systolic murmur, if that is an evidence of endocarditis) is unaccompanied by disease of the mitral valve (as evidenced by the presence of a mitral systolic murmur),<sup>1</sup> I would expect it to be still less severe, and I would expect it "to pass off, and the murmur indicative of it to have ceased altogether, or to be steadily declining on the recovery of the patient."

In short, this argument is of no value unless you grant—and this I am not prepared to do—that endocarditis of the tricuspid must in a large proportion of cases necessarily terminate in the production of permanent organic disease.

(3) "*The tricuspid murmur was frequently associated with a mitral murmur, and less often with a mitral-aortic or an aortic murmur of recent origin*"

This again seems to me to be no argument against the tricuspid murmur being indicative of tricuspid endocarditis; in fact, it is just what my pathological experience would lead me to expect, for I have almost invariably found tricuspid inflammation associated with endocarditis in the left heart.

(4) "*I have observed,*" he says, "*tricuspid regurgitation as a marked and lasting feature in a case of buttonhole contraction of the mitral valve; in several instances in which the tissue of the lung was permanently condensed, owing to repeated attacks of bronchitis; in patients affected with contracted granular kidney, in whom obstruction of the pulmonary circulation with enlargement of the right ventricle had followed upon obstruction of the systemic circulation, with its attendant tension, dilatation, and thickening of the systemic arteries, and hypertrophy of the left ventricle.*"

With the facts contained in the above statement, I, of course, entirely agree. I fully admit that obstruction to the flow of blood through the left heart or through the lungs is a common—I would say, by far the most common—cause of tricuspid regurgitation; but I do not agree with Sibson's further conclusion that "these circumstances (Arguments 1, 2, 3, and 4) point irresistibly to the conclusion that the tricuspid regurgitation [in the early stage of acute rheumatism, B. B.] is usually due to the so-called 'safety valve' function of that valve, and not to endocarditis of the right heart." Nor can I admit that inflammation of the left side of the heart, even when there is no regurgitation through the mitral orifice, impedes the flow of blood from the lungs into that side of the heart, and that the accumulation of the blood in the pulmonary vessels, thus caused, induces and is relieved by this tricuspid regurgitation. I see no reason for supposing that the obstruction to the flow of blood through the left heart is sufficiently great in the early stages of left-sided endocarditis to produce tricuspid regurgitation. It seems to

<sup>1</sup> Sibson is considering those cases in which a tricuspid murmur was alone present. The same arguments, of course, hold with regard to those cases in which mitral murmurs were present.

me much more probable that the tricuspid leakage is due to a rheumatic affection of the right heart (either a rheumatic affection of the muscular wall of the right ventricle with resulting relative, or muscular incompetence, or a rheumatic endocarditis, involving the tricuspid valves, or both), just as mitral regurgitation under such circumstances is, in my opinion, due to a rheumatic affection of the left heart.

This conclusion is, I think, supported by the intrinsic evidence afforded by a close examination of Sibson's cases.

(A) Take, for example, the date of the appearance of the tricuspid murmur and the length of time it continued in the 27 cases in which it was associated with a mitral murmur.

"In 7 of the 27 cases, the presence of a tricuspid murmur was somewhat doubtful. *In 8 of these cases the mitral was preceded by the tricuspid murmur, and in 6 of these the tricuspid murmur had ceased to be audible when the mitral came into play.*<sup>1</sup> In 13 other cases both murmurs were present when they were first noticed, which was at the time of admission, in fully one-half of those patients. *The tricuspid murmur disappeared when the mitral murmur was audible in two-thirds of the cases (16 in 27);*<sup>2</sup> both murmurs ceased at the same time in 7 instances; and in 4 the tricuspid murmur outlived the mitral."

Now if the tricuspid murmur had been produced, as Sibson supposed, by the left-sided endocarditis and the resulting obstruction to the blood flow through the left heart, it would surely have been most marked when the mitral regurgitation was at its height, for the obstruction would then necessarily have been greatest; and if this were so, it is natural to suppose: *first*, that the tricuspid murmur would have appeared after the mitral murmur and not before it, but this was not usually the case; and, *secondly*, that it would have remained as long as the mitral murmur remained, whereas it disappeared when the mitral murmur was still present in two-thirds of the cases.

(B) Further, it will, I suppose, be admitted, that when a combined condition of aortic and mitral regurgitation is produced by endocarditis, the backward pressure is usually greater than when mitral regurgitation is alone present. If this is so, and if the tricuspid regurgitation is produced, as Sibson supposed, by obstruction in front, a tricuspid murmur ought to have been more frequently present in combined cases of aortic and mitral endocarditis than in mitral endocarditis alone. But this was not the case, for a tricuspid murmur was only present in 2 or 3 of the 8 cases of mitral-aortic regurgitation; whereas, it was present in 27 out of 50 of the cases of mitral regurgitation.

For the same reason, a tricuspid murmur ought to have been more frequently present in combined cases of mitral-aortic regurgitation than in cases of aortic regurgitation alone, since the backward pressure is usually much greater in the former than in the latter; but this was not

<sup>1</sup> No italics in the original.

<sup>2</sup> No italics in the original.



so, for a tricuspid murmur was present in about 4 (or, as is stated a little later on, p. 494) in 5 of the 10 cases of aortic regurgitation of recent origin, but only in 2 or 3 of the 8 cases of mitral-aortic regurgitation.

(C) Further, it will, I suppose, be generally allowed that when endocarditis attacks a heart which is already crippled with mitral, aortic, or mitral-aortic disease, the embarrassment of the pulmonary circulation is, as a rule, much greater than when a heart which was previously healthy is attacked. If, then, Sibson's view is correct, a tricuspid murmur ought to be more frequently developed when endocarditis is super-added to an already existing valvular disease, than when the heart is previously healthy. But this was not so. In the 22 cases in which there was previous valvular disease, a tricuspid murmur is said to have been present 5 times. Sibson adds (p. 464): "A tricuspid murmur was present in none of the seven instances with mitral-aortic valvular disease affected with endocarditis."

Such are my reasons for disagreeing with Sibson's explanation and for concluding that the tricuspid murmur occurring in the early stages of acute rheumatism is usually *due to a rheumatic affection of the right heart*.

Before leaving Sibson's statistics it should be stated that in 46 cases of recent endopericarditis which he summarizes in Table 3 (p. 462), a tricuspid murmur was only observed in 3. Now, in my experience, endopericarditis usually represents a more severe rheumatic affection of the heart than endocarditis alone; and my pathological observations clearly show that right-sided endocarditis occurs more frequently (or, to be strictly correct, is observed post-mortem more frequently) in cases of endopericarditis than in cases of endocarditis without pericarditis. I should, therefore, have expected a tricuspid murmur to have been present in a much larger proportion of cases of endopericarditis than Sibson's table shows.

The absence of a tricuspid murmur in some of these cases can, perhaps, be explained by supposing that the friction sounds which are usually heard over the right heart obscured the tricuspid murmur, which is always soft and faint in character, and often flitting and temporary in its continuance. But be that as it may, the comparative rarity of a tricuspid murmur in Sibson's cases of endopericarditis cannot be advanced as an argument in favor of (in fact, it is rather, I think, an argument against) his view; for it must, I think, be allowed that the obstruction to the passage of the blood through the left heart is, as a rule, greater in cases of endopericarditis than in cases of endocarditis alone; and if this is so, and if Sibson's theory is correct, the tricuspid murmur ought to be more frequently present in cases of endopericarditis, than in cases of endocarditis alone.

The final conclusions which I would draw from this investigation are:

(1) That my pathological experience leads me to believe that right-



sided endocarditis is much more frequent than is usually supposed; and that this conclusion is in no way contradicted, but on the contrary rather confirmed, by clinical evidence and clinical facts.

(2) That Sibson's arguments against the tricuspid murmur of early acute rheumatism being indicative of right-sided endocarditis, are not valid.

(3) That, in my opinion, a tricuspid murmur occurring in the early stages of acute rheumatism in a previously healthy person who is not anæmic, is indicative of a rheumatic affection of the right heart.

(4) That whether (a) the tricuspid regurgitation is the *direct* result of the inflammation of the tricuspid valve, or whether (b) it is due to a rheumatic affection of the wall of the right ventricle, with resulting relative or muscular incompetence, the pathological evidence seems to show that when the right heart is so affected in acute rheumatism as to produce a tricuspid leakage, inflammation of the endocardium of the right heart is often (usually?) present.

(5) That although right-sided endocarditis is of frequent occurrence, it is comparatively seldom followed by permanent organic disease of the tricuspid valve; in short, that right-sided endocarditis is an eminently curable affection.

The importance of this conclusion, if it be correct, can hardly be over-estimated. It is not a conclusion of mere scientific and pathological interest, but is of the greatest practical and therapeutical value. It strongly supports the other arguments which I have advanced in my work on the *Diseases of the Heart* to show that mitral endocarditis is also a curable affection, a view which is by no means accepted by many of our very best and most trustworthy authorities. Thus Bristowe says "the prognosis of endocarditis is very serious. It is rare, indeed, for perfect recovery to take place."<sup>1</sup>

Further, it shows, I think, the immense importance of rest in the treatment of endocarditis. The only reasonable explanation of the fact that mitral endocarditis is more severe and more frequently terminates in permanent valvular disease than tricuspid endocarditis, seems to me to be that the closure of the mitral segments is more forcible and that the inflamed mitral segments are subjected to greater strain than the tricuspid segments. In treating cases of mitral endocarditis our main object should be to imitate nature's method of cure; to place the mitral valve, so far as we are able to do so, in the same condition as the tricuspid valve; in other words, to reduce the force (and also the frequency) of the cardiac contractions and to allow the products of inflammation to be absorbed just as they are usually absorbed on the right side of the heart.

<sup>1</sup> The Theory and Practice of Medicine, fifth edition, p. 518.

REPORT OF A CASE OF  
INSANITY FOLLOWING GUNSHOT INJURY TO THE HEAD;  
CEREBRAL CYST; ASPIRATION; RECOVERY.<sup>1</sup>

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HAVING consulted such files of leading journals and standard works on mental and nervous diseases, surgery, etc., as were readily accessible, without finding a case closely resembling the one described in the following pages, I do not feel wholly unwarranted in soliciting your indulgent attention to a brief recital of the clinical history of a case, which, to me, is in some respects unique, and which would seem to warrant recording on account of its intrinsic interest, and, also, as a clinical contribution to the study of the localization of brain functions, a subject, the accurate determination of which is now engaging the earnest attention of distinguished investigators at home and abroad.

CASE.—Darwin Dingman, convict, aged twenty-seven years, native of New York State, married, a farmer by occupation, and of intemperate habits, was admitted to the State Asylum for Insane Criminals, from the New York State Reformatory, on June 6, 1885, upon the certificate of Dr. H. D. Wey, physician to the Reformatory. The commitment stated that Dingman was convicted in Delaware County, of assault in the first degree, and sentenced, on February 27, 1883, to the State Reformatory for a maximum term of ten years; that on a former occasion he had been confined in jail at Cooperstown, for sixty days, on a charge of intoxication; that he was addicted to both liquor and tobacco; that he had been employed in prison as a general laborer and stonecutter; that his present bodily condition was good; that he had a depression of the external table of the frontal bone said to have been caused by a pistol ball three or four years ago; that, so far as known, he had not been insane before conviction; that his heredity was not known; that at the time of his conviction he was a "crank," but not regarded as insane; that he was probably addicted to self-abuse; that his habits as to sleep and food were irregular; that he had been confined in a cell since the present outbreak of violence began, four days previously; that the form of his insanity was chronic mania, and the cause, possibly a bullet wound in the frontal region. Dr. Wey further stated that he based his opinion as to the patient's insanity upon the following grounds: "that on the morning of June 2d he was discovered in an excited state, pulse quickened, skin dry, tongue pasty and covered by a whitish fur; he refused to answer questions, stared sullenly at those who approached him, and occasionally muttered 'Go away and don't tantalize me.' He resisted being examined, and it was necessary to use force to bring him out of his cell and place him where he could be observed. For the last four days he has been under my observation, and during that time he has refused to answer

<sup>1</sup> Read at the annual meeting of the New York State Medical Association, November 17, 1885.  
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questions or communicate in any way. He has been emotional, and upon being talked to or chided will lose self-control and cry. His manner and actions would indicate he is suffering from a delusion which he has thus far concealed.

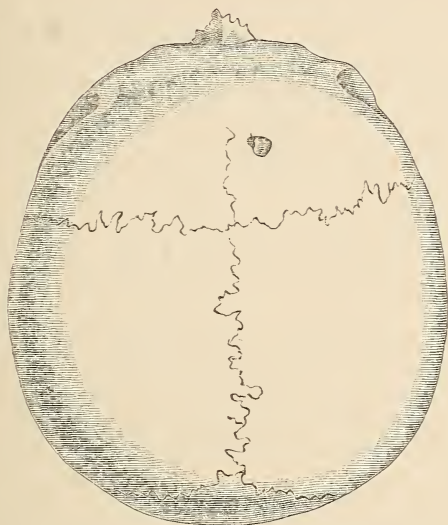
"For a number of weeks past his cell-mate has noticed that he has surrounded all his actions with an air of mystery and that he has been irritable and uncertain in his temper. At work he has been quick to fly into a passion, resenting with sullenness and displeasure any directions given him as to how to perform his work. Ever since his admission to the Reformatory, in March, 1883, he has, at intervals of two or three months or longer, been subject to attacks of irritability which were regarded as outbursts of an ungoverned temper rather than as proceeding from mental disease and organic brain trouble the result of the former injury to his head, the mark of which is to be found in the frontal region beneath the hair.

"Recalling his actions and manners in the past, and connecting them with his present condition, I am inclined to believe there has been mental disturbance, varying at times in intensity, for several weeks past or even for months."

On admission to the asylum, about 11 A. M., the patient was in a state of violent maniacal excitement, with marked bodily agitation, so much so that it was impossible satisfactorily to make the usual physical examination of the chest organs. When spoken to he would not reply, but would shake his head violently, strike the top of his head with his hands, and thrusting his fingers into his hair would frantically pull it as if to relieve himself from the great distress which he evidently suffered. He was immediately sent to the ward, given a warm bath, placed in bed, and kept under special observation for the purpose of determining his exact condition uninfluenced by drugs. At noon he refused food, the sight of it seeming to excite an exacerbation of the violence, as also did any attempt to examine his head; his face presented a livid, dusky hue, and his hands were cold and clammy; pulse 116, and quite feeble; temperature  $100^{\circ}$ ; respiration 40; pupils dilated: tongue milky in appearance, broad, flabby, and edges indented by teeth; so far as could be determined by careful examination, there was no paralysis, anæsthesia, or disturbance of the special senses.

An examination of the head revealed a nearly circular depression of the skull about half an inch in diameter and about a fourth of an inch deep at the centre, and corresponding to which, in the scalp, was the point of crossing of a crucial scar. The skull lesion was located, as nearly as could be determined by external measurement, over the right first frontal gyrus at a point corresponding to the junction of its anterior and middle third, being about one and three-eighths inches from the margin of the hairy scalp and about three-eighths of an inch to the right of the median line. The least pressure upon the point of depression seemed to produce intense pain and would throw him into violent bodily agitation. During the afternoon he remained substantially in the same condition as above described; at 6 P. M. he again refused solid food, but took, voluntarily, a pint of eggnog containing mag. sulph. half an oz., and potass. bromid. grains 40. He continued restless and sleepless throughout the night, drinking water with avidity several times; also had one movement of the bowels, and passed a moderate amount of urine, which had a specific gravity of 1.035, but contained neither casts,

albumen, nor sugar; on the following morning he seemed worse, shaking his head and striking it violently with his hands or upon the floor, and wildly clutching his hair with his fingers, requiring the constant presence of an attendant to prevent him inflicting self-injury. About 7 A. M.



Depression three-eighths inch from the median line and one and three-eighths inches from the edge of the hairy scalp.

he drank a cup of coffee and some water, but refused to eat or speak and frequently smacked his lips and moaned. His pupils were dilated, and his eyeballs presented a staring appearance; pulse 104, temperature  $99\frac{1}{2}^{\circ}$ , respiration 40. At 11 A. M. he was given, subcutaneously, twelve minims of Magendie's solution of morphia, which partly calmed him for about one hour, when his symptoms returned with increased violence.

From the nature of the symptoms, and in the then absence of information as to the removal of the bullet, I was of the opinion that the seat of the mischief was in the immediate region of the skull lesion, and that the trephine would probably reveal the existence of either the bullet itself, a spicula of bone, or an abscess, or possibly the latter in association with either of the two former. This opinion was concurred in by Dr. W. S. Cheesman, of Auburn, who was present by invitation, and my assistant, Dr. Wells, who performed the operation; all agreeing not only as to the propriety of the operation, but that such a procedure was demanded, in accordance with the sound surgical doctrine laid down in the following language by a recent writer on injuries to the head:<sup>1</sup> "The later forms of compression of the brain by lymph and pus, are peculiarly grave, and unless remediable by the surgeon's giving them free vent, and too often then, they sooner or later destroy the patient." Ac-

<sup>1</sup> Charles B. Nancrede, M.D., "Injuries of the Head," Ashhurst's Encyclopædia of Surgery, vol. v. p. 66.



cordingly it was decided to make an exploratory operation, by cutting down upon and laying bare the skull at the point of depression, to ascertain its condition, and, if necessary, trephine it.

At 3 P. M., the patient having been etherized, the skull was exposed by a crucial incision through the scalp at the point indicated; on dissecting back the flaps, which were firmly bound down to the bone by cicatricial tissue, it was found that the opening in the skull was not closed by bony union, but was completely bridged across by dense fibrous tissue. Finding the skull thus pervious, it was thought best, before using the trephine, to explore the region beneath the dura mater, by means of a hypodermatic syringe, which should serve the double purpose of a probe and aspirator, after the manner proposed by Drs. Fenger and Lee,<sup>1</sup> "as a means of ascertaining the seat of abscess through the trephine opening."

The needle of the syringe was inserted in three several directions, care being taken to avoid lateral movements of the instrument, each time to the depth of about one inch, with entirely negative result; on the fourth insertion, however, the direction of the needle being downward, forward, and outward, the syringe, on withdrawing the piston, was instantly filled with a clear, serous fluid. This was repeated several times until nearly two drachms of transparent serum had been removed, and no more could be obtained. A microscopic examination of the serum, made while the patient was still under ether, showed nothing but a few fresh blood corpuscles, which were regarded as extraneous, and, consequently, of no significance.

Desiring to limit the gravity of the operation to the minimum, it was now deemed advisable not to expose the brain by trephining, but to let the patient emerge from the effect of the anæsthetic, and to note whether or not the tapping had afforded him any relief. The wound was accordingly closed by horsehair sutures, and dressed antiseptically. As soon as the effect of the ether had passed off, the patient began to converse, and, to our surprise and gratification, in a perfectly rational manner. He said that he felt well and expressed great gratitude at finding himself free from the pain in his head, which he said he had suffered almost constantly for upward of two years. On being offered a dose of whiskey, which he recognized by the odor, he said he would rather not take it, unless it was deemed absolutely necessary, as whiskey had been the cause of all his trouble.

At 6 P. M., less than three hours after the operation, he gave a lucid and detailed history of the circumstances attending his injury and subsequent condition; the essential points of which are as follows: Says that he has always been healthy, and that there is no insanity in his family; that on January 26, 1883, after having drank to excess, he quarrelled with his wife and attempted to shoot her; failing in which, he, with suicidal intent, shot himself in the head, inflicting the injury above described; the weapon being a small pistol, the calibre of which he did not know. The shot rendered him unconscious for a time, the duration of which he was unable to state. On regaining his senses he found himself in the county jail, to which he probably had been committed to await the result of his injury.

He learned, at the jail, that Dr. George F. Entler, of Oneonta, had

<sup>1</sup> "Abscess Cavities in the Brain," AMERICAN JOURNAL OF THE MEDICAL SCIENCES for July, 1884.

attended him at the time of the injury, but failed to learn whether the bullet had been removed.<sup>1</sup>

Dingman was subsequently indicted for assault in the first degree, tried, convicted, and sentenced to the State Reformatory, as has been mentioned. He says that he was comparatively free from head symptoms during the first six months of his stay at the Reformatory,<sup>2</sup> then he began to suffer from frequently recurring frontal headache, the pain being at times almost unbearable. He also became very irritable and emotional, slept badly, and experienced much difficulty in pursuing his studies, the least mental effort seeming greatly to aggravate his head symptoms.

He went on in this way until about June 1, 1885, at which time he was assisting in laying tile at the Reformatory, which is the last thing he remembers prior to finding himself in the asylum after the operation.

As soon as the patient had fully recovered from the effects of the ether he was given some milk-punch, and at 9 P. M. received thirty grains of chloral, which caused him to sleep well during the remainder of the night.

*June 8.* Is quite rational, says he feels well, with the exception of a slight pain in the head. Took, with apparent relish, his breakfast, consisting of toast, eggs, milk, and coffee. Morning: pulse 84, temperature  $99\frac{1}{2}^{\circ}$ , respiration 28; slept more or less during the night. In the evening complained of slight pain in the frontal region, and asked to have the bandage loosened a little, which was done. Pulse 90, temperature  $99^{\circ}$ , respiration 26.

*9th.* Slept well last night; awoke refreshed and entirely free from pain. Pulse 92, temperature  $99\frac{1}{2}^{\circ}$ , respiration 32. Slightly delirious in the evening; pupils moderately dilated. Evening: pulse 88, temperature  $99^{\circ}$ , respiration 40. Was given twenty grains of chloral hydrate at 10 P. M., after which he fell asleep.

*10th.* Rested well during the night and awoke refreshed, cheerful, and quite free from pain; pulse 84, temperature  $98\frac{3}{4}^{\circ}$ , respiration 26. Evening: pulse 80, temperature  $99\frac{1}{2}^{\circ}$ , respiration 28; gratefully refers to freedom from pain. Was again given twenty grains of chloral, which produced sleep.

*11th.* Passed a good night, says he feels well and is free from pain. Pulse, temperature, and respiration normal.

<sup>1</sup> At the time of the operation the writer did not know whether the bullet, or any portion of the skull, had been removed. Dr. Entler writes me, under date of July 14th, as follows: "Darwin Dingman received an injury (he will give you the date) by a pistol-shot fired by himself. The ball entered the soft parts near the anterior border of the first convolution (right side); being unable to find the ball by the aid of a probe, I thrust a grooved director under the skin as far as it would go and cut to the point of the instrument (about an inch) here, at the point at which you found the cyst, the ball was found between the two bony tables of the skull; after cutting away a small portion of the bone the ball was with difficulty removed. By the aid of a probe was able to explore the hole thus left, but I did not find any fracture of the inner table, or 'marked depression.' The same day he was removed to Delhi, the county seat, and I did not see him after. The case is certainly a singular one, and I would be glad to hear more of it. The ball I am unable to find, although I had the same for a long time in my office. Will send it you should I ever find it."

<sup>2</sup> The following copy, kindly furnished me by Dr. Wey, of an entry made in the Reformatory Biographical Register, on March 11, 1883, five days after Dingman's admission to that institution, would seem to throw some doubt upon the accuracy of this statement: "D. Dingman, when coming through the hall to-day, was flourishing and gesticulating with his hands in a very excited manner; being locked up in his room, he walked up and down, repeatedly saying, 'Yes, I killed her, G—d—n her, I intended to kill her.'"

*13th.* Continues the same. The dressings were removed to-day, also the sutures; the scalp wound has healed by primary union; patient eats and sleeps well; says he "never felt better in his life."

*26th.* Since last record the patient has been up and about the ward daily, and is doing well in every way.

*July 7.* Continues well. Was to-day detailed as table waiter, at his own request.

*September 29.* Patient is now in robust health, having increased forty-five pounds in weight since his admission to the asylum. With the exception of a mild evanescent delirium on the evening of June 9th, he has been continuously free from mental disturbance since the operation was done. He was to-day transferred to the Reformatory, as recovered.

*November 9.* A letter received from Dr. Wey, under date of November 8th, contains the following: "I saw Dingman this morning and examined him carefully. He is now in as good health as at the time of his return. He tells me he has no more headache, eats and sleeps well, and feels in every way better than he has in three years. I have had him excused from all school work, and trust that by thus relieving the pressure upon him he may make such a record as will gain him a speedy release."

The points to which I would call particular attention in the report of this case are the following:

1. A lesion located anteriorly to that portion of the first frontal gyrus included in the centre marked 12, by Ferrier, and which is now regarded as the anterior boundary of the motor area giving rise to psychic derangement, and unaccompanied by motor or sensory disturbance, furnishes affirmative evidence, both positive and negative, of the correctness of the view held by a majority of modern neuro-physiologists, namely, that the motor and sensory areas of the cerebral cortex are not located in that portion of the brain lying anterior to the coronal suture, and aptly designated by Ferrier "the præfrontal lobes or antero-frontal region."<sup>1</sup>

2. That when not in a state of inflammation, the brain substance may be punctured with a fine, clean needle, with comparative immunity from danger or disturbance of function.

3. The certainty that recovery in Dingman's case was directly due to the operation.

4. Cases of insanity dependent upon injury to the head, and accompanied, as they usually are, by mental irritability and explosions of temper, are, as a rule, so seldom benefited by drugs or the so-called moral treatment, that they have come to be regarded as incurable from the beginning; in fact, I believe it is the custom of most writers upon insanity to speak unfavorably regarding the prognosis in these cases. That the prognosis is bad in a considerable proportion of cases of traumatic insanity must, I think, be conceded, but it is equally true that a certain limited

<sup>1</sup> The Localization of Cerebral Disease, Ferrier, Fig. 27, page 59.



number may be cured, or, at least, greatly improved by timely surgical interference. Obviously, the cases which are most likely to be benefited by operative procedure are those of which the one just reported is a type—that is, cases with depression of the skull, in which the location of the brain lesion can be determined with a reasonable degree of accuracy, the site of the lesion being such as to render the use of the trephine anatomically admissible.

By reason of the numerous and valuable contributions which have recently been made to our knowledge of neuro-physiology and the localization of cerebral disease, the practice of trephining for the relief of epilepsy resulting from injury to the head has been revived, and may now be said to have become quite fashionable, if one may judge from the frequency of cases reported in the journals of the day; such being the case, it would seem to be not unreasonable to maintain that the arguments advanced in favor of the operation for epilepsy, would apply with even greater force to cases of lunacy depending upon similar causes.

As long ago as 1848, Dr. C. Lockhart Robertson, then physician to the Military Asylum at Yarmouth, England, ably advocated trephining for the relief of insanity with depression of the skull, the result of injury to the head. He reports a case of ten years' standing which was cured by the operation.<sup>1</sup> He, also, in the same article, cites two other cases as having been permanently cured in this way.

Dr. G. Mackenzie Bacon, Superintendent of the Cambridge Asylum, England, has recently reported a case of complete recovery following trephining of the skull in the case of a lunatic, nineteen months after the reception of a blow upon the head.<sup>2</sup>

These successful cases, together with that of my own, are suggestive, not only to those who are especially engaged in treating the insane, but to the general practitioner as well, into whose hands insane patients usually come in the early and most important stage of their malady, and upon whose judgment and advice, as the family physician, the friends of patients are wont to rely.

5. That simple cysts in the brain substance are exceedingly rare.

Ross, in his valuable work on *Diseases of the Nervous System*, page 557, says: "Cystic growths in the brain are not as common as was formerly supposed." Bastian, in speaking of the morbid anatomy of adventitious products in the brain, affirms that "it seems extremely doubtful whether simple, serous cysts are ever met with in the substance of the unaltered brain tissue;" and again, "It is true that larger cysts are not unfrequently met with in the brain; but these, when not due to one of the two forms of cystic entozoa to be hereafter described, should rather

<sup>1</sup> "On the Application of the Trephine to the Treatment of Insanity, the result of Injury to the Head," Winslow's Psychol. Journal, January, 1848.

<sup>2</sup> Journal of Mental Science, January, 1881.



be termed pseudo-cysts, since they are not primary formations, but have resulted from the modification of preëxisting states.”<sup>1</sup>

Dr. E. C. Seguin, reported to the American Neurological Association, in 1885, a case in which at the autopsy there had been found a cyst of the superior portion of the vermis extending into the right cerebellar lobe.

In the *Transactions of the Clinical Society of London*, vol. vi., Dr. J. Lockhart Clarke reports a case of cysts of the cerebellum following a wound received in early life; but Dr. Clarke was not satisfied that the cysts could be attributed to the injury. He also gives, coincidentally, the history of the patient's mother, who had cerebral symptoms apparently dependent upon an accident, and who had a cyst in the central white substance of the cerebellum on each side. Dr. Sharkey reported to the London Pathological Society, June 17, 1881, a case of cerebellar cyst following an injury to the back of the head. The cyst “was not a hydatid, and had no inflammatory thickening of the cerebellar substance around it, nor were there any hæmatoidin crystals or other remains of effused blood.” He concludes, “simple cysts of the brain are rare, and their pathology obscure.”

In the *Revue de Chirurgie*, July 10, 1883, a French surgeon<sup>2</sup> reports a case of epilepsy with hemiplegia, following injury to the head two years previously. The intellect becoming clouded, it was decided to trephine, the instrument being applied to the right side over the Rolandic fissure. “As the operation proceeded, a crack was seen in the skull, and in the arachnoid was found a little cyst the size of a pea. This was removed, and the surface of the brain was scraped where it seemed to have undergone some alterations. The epilepsy and hemiplegia disappeared at once, and had not returned at the time of the report, a month after the operation.”

An examination of the histories of ninety-nine American cases of brain disease, which are collected, classified, and critically analyzed by Dr. M. Allen Starr, of this city, in his recent valuable contribution to the study of the functions of the cerebral cortex,<sup>3</sup> reveals no case of simple, uncomplicated serous cyst.

Finally, inasmuch as the brain was not exposed, and the fortunate termination of Dingman's case precluded an autopsical verification of the diagnosis, it may be objected that the history of the case, as given, does not warrant the opinion that this was an instance of simple serous cyst. In reply to possible objections, the writer would say that the opinion as to the nature of the cyst was arrived at partly by the process of exclusion, and is based upon the following grounds, namely, both the gross and microscopical appearance of the serum showed none of the

<sup>1</sup> Reynolds's System of Medicine, vol. ii. p. 496.

<sup>2</sup> M. Demons, of Bordeaux.

<sup>3</sup> AMERICAN JOURNAL OF THE MEDICAL SCIENCES for April and July, 1884.

products usually resulting from changes occurring in the seat of circumscribed softenings or old effusions, nor were there evidences of echinococci, cysticeri, or other adventitious products which are known to occur in the brain in cystic form, and the existence of which would almost certainly insure a fatal termination.

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## ON RECENT PROGRESS IN HOSPITAL PLANNING AND ARRANGEMENTS.

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It has been well remarked by Dr. Mouat that hospitals in this country have not, as regards their construction and management in relation to the treatment of disease, kept pace with the advance of civilization in other branches of social economy. While, on the one hand, medical and surgical science are constantly and steadily advancing in the path of progress, it must be admitted that, with one or two exceptions, the science which concerns itself with the construction and arrangements of the buildings in which the treatment of the sick has to be done, is very much in the state in which it was twenty years ago. We hear of the same hospital diseases which were supposed to be inherent in the older forms of construction, taking root and flourishing in the newest and most costly buildings; and we look in vain amongst the larger hospitals for any indication of that careful thought for structural improvements, both in general plan and in administrative details, which characterizes in so marked a fashion many of the newer hospitals in France, Germany, and Belgium.

Exceptions must, however, be made in favor of three classes of buildings: (*a*) Infirmarys attached to workhouses; (*β*) Hospitals for infectious diseases; and (*γ*) Cottage hospitals.

In the first two classes much and excellent progress has been made; and the credit for this progress is very largely due to the guiding and controlling influence of the responsible advisers of the Local Government Board.

Of the many large and admirable buildings for the treatment of the sick and infirm poor which have been erected during the last few years, perhaps the Marylebone Infirmary at Notting-hill, is one of the best and most complete examples. This building, which was opened in June, 1881, affords accommodation for 744 patients, in 36 wards of 2 beds each, and 24 wards of 28 beds each. The site is a rectangular piece of

land somewhat limited in area, having a ratio of 82 square feet of site per bed, and the buildings are arranged in four parallel pairs of pavilions running north and south, with the administration block in the centre. The ward pavilions are three stories in height, and the space allotted to patients is as follows: Wall space 6 feet, floor space 72 feet, and cubic space 936 feet. The beds are arranged in pairs with a window between each pair, and the windows are in all cases opposite each other. The amount of space allowed in the wards of workhouse infirmaries was determined by a committee appointed by the Poor Law Board in 1867, and in their report, which forms the foundation for the regulations laid down by the Local Government Board (the successors of the Poor Law Board), they recommend that the minimum cubic space should be 850 feet per bed, and the wall space not less than 6 feet per bed; and in cases where the height of the ward is more than 12 feet, such additional height is not to be taken into consideration in estimating the cubic space per bed. In determining these amounts, the Committee had in view the fact that the cases treated in workhouse infirmaries are largely of a chronic and non-acute character, and that therefore the air space required would not be so large as in wards for the treatment of acute surgical or medical disease. A special feature of the St. Marylebone Infirmary, which does not exist in connection with any other workhouse infirmary, is the Nursing Home, for training women specially in the work of nursing in institutions of a similar nature. This is a step in the right direction, the wisdom of which it is scarcely possible to overestimate. To anyone who has seen the old pauper nurse at work, it will not be difficult to realize the difference between the old order and the new, and to appreciate the altered tone of a ward administered by a properly trained nurse.

The value of hospitals for infectious diseases as a means of isolating the sick from the healthy, and so of arresting the spread of disease, was recognized at a very early period in the history of these institutions. But the necessity for the provision of hospital accommodation seems to have been mainly, if not entirely, felt and acted upon in large and crowded towns where diseases like typhus and relapsing fever have been, under specially insanitary conditions, such as overcrowding and filth, almost endemic. It is only of late years that, owing to the persistent counsel of the Local Government Board, local sanitary authorities have been convinced of the extreme value of even the smallest hospital accommodation as a preventive rather than as a curative agent. In many cases the provision made is of a most temporary and perfunctory nature; and, as Dr. Thorne points out in his report (Supplement to the Tenth Annual Report of the Local Government Board, 1880-81) those hospitals which have been erected under the influence of panic rarely prove adequate for the needs of the district even in non-epidemic times; while the hospitals that are erected in order to prevent epidemics by providing

ready means of isolation for first cases are, as a rule, excellent examples of the kind of provision that is required.

One of the best instances of this is the small isolation hospital built by the Bournemouth Sanitary Commissioners. This hospital comprises at present three detached buildings: the administrative building, in which are dwelling-rooms for the matron and nurses; the ward block; and a building containing mortuary, disinfecting-room, wash-house, and ambulance shed.

The ward block is a reproduction in principle of the small isolation block at the London Fever Hospital; it contains two wards for three beds each, and two wards for two beds each. The three bed wards are placed one at each end of the building, and between each three bed ward and the smaller wards is a nurses' room. The communication between the rooms is by way of an open corridor, off which are placed in projecting wings the water-closets and sinks. This corridor is divided transversely by a wall, which thus separates the building into two equal parts, each part containing two wards and a nurses' room and one of the two water-closet projections. The object of this arrangement is to provide for the treatment at one and the same time and under one roof of two entirely distinct diseases, as, for instance, scarlatina and small-pox. On the opposite side to the corridor is a wide veranda accessible to all the rooms, and which can, with proper administrative precautions, be used by all the patients. The site upon which these buildings stand is amply large enough to allow of the erection of two, or possibly three, more pavilions; but with the existing buildings as the permanent provision always available for the prompt isolation of the first case occurring in the district, it will probably be found, in the event of an epidemic breaking out, more convenient to provide for an increased number of patients by means of tents or huts; the former being disinfected and stowed away, and the latter burnt, at the end of the outbreak.

A remarkably interesting example of a hospital for infectious diseases is the Communal Hospital at Copenhagen, completed in 1883. The reasons put forth by the municipal authorities for the establishment of this hospital are so very pertinent, that no apology need be made for quoting them here: "En bâttissant l'hôpital des maladies épidémiques on ne voulait pas seulement un établissement où pouvaient être soignés les malades atteints de ces affections, mais on visait encore à un autre but. Possédant une institution où pouvaient être isolés immédiatement, non seulement les individus atteints d'une maladie contagieuse mais encore les cas suspects, on espérait pouvoir préserver autant que possible la ville des épidémies. Ainsi l'hôpital devait être une institution préventive." (*Description sommaire de l'hôpital des maladies épidémiques de Copenhagen*, par S. T. Sarsen and F. J. Hermann, Copenhagen, 1884.)



The hospital comprises thirteen separate buildings, eight of which are ward blocks, the other five being used for administrative purposes. These buildings are all entirely detached, there being no covered communication whatever between one block and another.

In the front administrative block, which contains the offices and residences for staff, are two points of detail that are noticeable. One is the arrangement for visiting. The patient to be visited (visiting being restricted, so far as possible, to convalescents) enters the building by the door communicating with the garden, and awaits his visitor in a room close to the entrance. The visitor enters the building on the opposite side, and is taken to a room immediately adjoining that in which the patient is, but he traverses no part of the building through which the patient has been before him. Between the two rooms is a window protected by a "grille," and while the patient and his friend can see and converse with each other, they cannot come within touching distance.

The other detail is the arrangement of bath and dressing-rooms for the medical staff. This consists of a bath-room with a dressing-room on each side; when leaving the hospital after going round the wards, the physician enters one of the dressing-rooms, where he divests himself of his hospital clothing, passes into the bath-room, where he takes a bath; and so into the other dressing-room, where he finds his ordinary clothes.

Two of the pavilions are divided up into single bed wards; in one case these wards are for doubtful cases, or for cases needing special isolation; in the other they are for private patients, presumably paying for the extra accommodation.

All the buildings are provided with very complete means of ventilation and warming by the aid of "calorifères" and hot-air stoves on the system so much adopted in continental hospitals.

An instance of a really complete and well-considered hospital of a purely temporary nature is the Infectious Disease Hospital at Park Hill, Liverpool. The wards of this hospital consist of four pairs of hospital tents and two pairs of iron buildings. The buildings containing the nurses' rooms, bath-rooms, and day-rooms are formed of wooden framing, covered externally with Willesden paper and lined internally with boarding, the interspace being filled with silicated cotton.

A notable fact in connection with this hospital is that it was erected and completed ready for use in less than two months.

The two great "barrack" hospitals at Berlin (the "Moabit" and "Charité") are examples of a more or less temporary method of construction, though neither is used exclusively for fever or smallpox. The wards in both cases are constructed of wooden framework, the interstices being filled at the "Moabit" Hospital with stone, at the "Charité" with bricks laid dry. The "Moabit" Hospital is warmed by means of

steam-pipes from a central boiler-house, while the wards at the "Charité" are each warmed by two iron stoves faced with white Dutch tiles, provided with an arrangement of coils of iron pipes for increasing the radiating surface. In order to overcome the extreme dryness of the air warmed by this means a pan of water is introduced into the stove, in such a manner that the heat of the fire evaporates the water, and the resulting vapor mixes with and moistens the warmed air from the iron surfaces. The "Moabit" Hospital was originally designed, in 1872, purely as an epidemic hospital, but since the year 1875 it has been used for the treatment of diseases of every kind except mental affections. In the year 1880, for example, of a total of 2780 cases treated in the Hospital, 697 are classed as acute infectious diseases, 491 as surgical, and 774 as diseases of the organs of respiration.

The great advantage of temporary hospitals for the treatment of infectious fevers, is the ease and quickness with which additional accommodation can be provided on a sudden emergency; but the danger of fire in tents or huts is a matter that must be provided against in the most careful manner.

Coming now to the subject of general hospitals, under which term may be included the class of small hospitals known as "cottage hospitals," it will be interesting in connection with the question of temporary as opposed to permanent hospitals, to note the views of an eminent authority on the subject, Dr. Billings, U. S. A. After remarking ("Essay on Hospital Construction and Organization," New York, 1875) that the results given by many large and costly buildings were by no means commensurate with the labor, money, and ingenuity expended on them, that hospital diseases had made their appearance in many such buildings, and that attempts at purification and disinfection had not always been successful, Dr. Billings shows how the experience of the military surgeons during the American Civil War and all the recent wars in Europe led to the recommendation that wooden barracks and tents should be adopted for all hospitals. The reasons for this advice were not only that huts and tents are more readily disinfected and ventilated than permanent structures, but that, inasmuch as all the buildings are liable to become saturated, so to speak, after a certain time with the contagion of disease, it is easier and cheaper to abandon or to destroy a wooden hut than it could be to destroy a building of brick or stone.

These views Dr. Billings subsequently modified greatly, and his opinions may be summarized thus: For military hospitals and for infectious diseases, huts are probably better suited than permanent wards; but for general hospitals, where much subdivision of patients is necessary, and where economy of administration is an element to be regarded, permanent structures are preferable. The advocates of temporary wards maintained that their system was unfavorable to the

development of hospitalism. This, Dr. Billings shows to be an error. "I have myself," he says, "emptied a barrack ward and placed the men in tents, on account of the appearance and persistence of septic disease. I have seen a decided tendency to erysipelas and pyæmia appear in a most characteristic barrack ward, an unplastered building, with excessive ridge ventilation, within six weeks after it was first occupied. The weather was warm, and for a week there was little wind, so that the process of natural ventilation was unsatisfactory." ("Essay on Hospital Construction," *op. cit.*, p. 17.) The chief reasons against the adoption of any system of temporary wards are the danger of fire and the great cost of administration consequent on the necessity for the buildings being all of one story only.

The most remarkable and, so far as England is concerned, perhaps the only development in general hospital building of recent years is the circular ward. Like all new inventions, the idea of adopting the circle for the purpose of a sick ward seems to have simultaneously occurred to more than one person. In 1876, when the question of rebuilding University College Hospital, London, was being seriously discussed, the distinguished surgeon to that hospital, Mr. John Marshall, F.R.S., devised a plan an essential part of which was that the wards were in the form of four circular towers. About the same time the foundations of a hospital were laid at Antwerp, the wards of which were arranged in eight circular towers; and at a period probably anterior to this, Sir Andrew Clarke, R.E., G.C.B., now Inspector General of Fortifications, prepared a plan for a hospital in Madras with circular wards.

The first circular wards to be actually occupied with patients were those of the Miller Memorial Hospital at Greenwich, a little building erected in memory of the late Canon Miller, founder of Hospital Sunday. Besides this there are in England three other examples of circular wards completed, viz.: Military Hospitals at Seaforth near Liverpool, and at Milton near Gravesend, and a workhouse infirmary at Hampstead. A general hospital is in course of erection at Burnley, which will have ultimately four ward pavilions of twenty beds each—and in New York, a Cancer Hospital with three circular towers is approaching completion.

The advantages of a circular ward are briefly these: 1st. It can be placed without difficulty in many positions in which it would be impossible to put a rectangular ward; 2d. In the placing of a circular ward upon a site, aspect can be wholly disregarded, except, of course, as regards the relation of the ward block to other buildings; 3d. A circular building can be so planned that the air can have free access to the enclosing walls along the whole length of the circumference—and in whatever direction the wind blows, it must blow at right angles to some point in the circumference; whereas it is conceivable that the wind when blowing in a parallel direction to the longer axis of a rectangular ward would

be practically lost for purposes of ventilation; 4th. A circular ward is economical of wall; of two wards each for a given number of beds and each having precisely the same amount of floor and cubic space, the circular ward will be enclosed in walls of a considerably less linear measurement than the rectangular ward; 5th. Provided that the warming apparatus, whatever it be, is placed in the proper position—*i. e.*, in the centre of the ward—the diffusion of warmth will be far more equable in a circular ward than would be possible in a rectangular ward; 6th. In the matter of free access of light and air a circular ward possesses advantages superior to those of any other form. As Professor Marshall points out, a circular ward is obviously the inverse of the plan condemned so strongly by Oppert, when he says, “the worst wards are those where least air and light are provided,” and “a closed court with wards around it is the worst arrangement.” (*Hospitals, Infirmaries, and Dispensaries*, by F. Oppert, M.D.)

Circular wards have scarcely been in existence long enough to warrant any positive statement being made as to their superior efficiency to wards of a rectangular form; but this much may be said as regards the work done by the Miller Memorial Hospital. In the first place, it has been amply demonstrated by these wards that the fears so strongly expressed that a circular ward would be ill-lighted and objectionable on account of the patients being presumably more visible to each other than in a rectangular ward, are entirely groundless. Then the fact, that during the eight months that the Hospital has been opened a constant succession of cases, chiefly surgical, and of a very severe nature, have been treated in the wards with uniform and marked success, is sufficient to show that the circular form, in this instance at least, is fully equal to the work required of it. Time alone will show whether this form of ward possesses the superiority which its advocates hope for it, in the more efficient aëration, or what may fitly be called its greater self-cleansing properties.

In order to endeavor to ascertain the special characteristics of a circular ward in the matter of ventilation, the Hospital Association has appointed a committee to conduct experiments, and endeavor to arrive at an estimate of the value of the circular form as compared with the rectangular. The task before the committee is by no means an easy one, but it is greatly to be hoped that their investigations will throw some light on a subject that has of late formed the battleground for a somewhat heated controversy.

Reference has been made to improvements in hospital construction abroad. Perhaps the most remarkable instance is the system devised by M. Tollet, and usually called by his name. The main feature of the system lies in the sectional form of the ward, which M. Tollet makes a pointed arch. It is essential to the system that the ward should be of



one story only, as an important feature of this particular form is that the outlet for vitiated air is at the apex of the arch. M. Tollet contends that by the adoption of this form the free passage of air is not liable to be checked by any internal angles. His system of construction, moreover, being entirely of iron and stone, brick, or concrete, is not only fireproof, but is said to present on the inside impervious surfaces, which afford no harbor of any kind for disease germs. Of the many buildings erected on this principle, the Municipal Hospital at St. Denis is perhaps the most complete, and best exemplifies M. Tollet's views. This hospital accommodates 166 patients, including aged, chronic, and infirm men and women, medical and surgical cases of both sexes, lying-in women, infectious diseases of both sexes. The buildings are entirely detached, the wards for medical cases alone being arranged in pairs, with a connecting corridor. The ward blocks are raised about two feet above the ground level, and have underneath an open space about eight feet in height, the ground around the wards being sloped away at an angle of forty-five degrees.

A feature to be remarked in this, as in many other recently erected hospitals on the continent, is the large proportion of land to patients—the ratio at St. Denis being 1570 square feet of site per patient.

The special characteristic, apart from M. Tollet's peculiar form of construction, of the hospitals erected on this system, and the feature that has probably the most important bearing on the well-being of the patients, are the way in which the wards are isolated one from the other, and the perfect classification of diseases of which this arrangement admits. This complete atmospheric severance of the wards is a feature which has been also largely adopted in the most recent hospitals in Germany. The most complete example of this is the *Academische Krankenhaus* at Heidelberg. There are in this hospital eleven separate ward pavilions, connected with each other and with the administrative block by a covered way with the sides entirely open; five of these pavilions being devoted to the reception of surgical cases, four to medical cases, one to skin diseases, and one to diseases of the eye.

Of all modern developments in hospital work, not the least interesting and important is that of the cottage hospital. The first cottage hospital opened in England was that at Cranleigh, in Surrey, which was founded by Mr. Albert Napper in the year 1859. By the year 1879 some two hundred hospitals had been started, and the probability is that this number has since increased to something not far short of three hundred. The hospital at Cranleigh is strictly a cottage, of a characteristic Surrey type, and its essentially cottage character is justly regarded by its founder as a valuable testimony to the success of his system. The building is partly of brick, partly of timber framing covered with tiles, and inside, the old brick chimney breast, the brick

paving, and the corkscrew staircase, with a rope for handrail, all remain to show how little modification the cottage has undergone to fit it for its new duties.

Of the many cottage hospitals which have been erected during the last few years, several fulfil well the conditions necessary to the successful treatment of disease; while many others, unfortunately, repeat only too literally the sanitary mistakes so fatally prevalent in buildings of a larger kind.

In this brief survey of the progress of hospital building in recent years, many points of detail have of necessity been passed over; such, for example, as baths for therapeutic purposes; appliances which, while they are to be found in almost every new and in many of the older hospitals abroad, can scarcely be said to exist in England. It must be admitted that the cause in great measure of the mistakes that are made is the want of *rapprochement* that exists between the medical and the lay element in hospital administrators. In planning a new hospital, or in improving an old one, an essential element of success is a cordial coöperation between committee, medical staff, and architect; and, unless these three authorities work together, and not, as is too often the case, the committee scheme, and their architect plans, without reference to the medical staff, failure is inevitable.

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## ABSCESS OF THE PANCREAS AND THROMBOSIS OF THE PORTAL VEIN.

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ABSCESS of the pancreas is of such rare occurrence that any opportunity to study its pathology should be taken advantage of and the facts, be they ever so meagre, brought to the notice of the profession. It is hoped that this consideration is sufficient apology for the following detail :

CASE. *Abscess of the Pancreas, communicating with the Duodeno-jejunal Fossa; Thrombosis of the Portal Vein; Ascites, rapidly recurring after Tapping; Tumor; Emaciation; Marked Absence of other Symptoms of Grave Disease; Death; Autopsy.*—W. B., male, aged forty-two, born in England, single, shoemaker, was admitted to the wards of the Presbyterian Hospital, May 12, 1885, and died June 6th following. He was under the care of Dr. Patterson.

Nothing could be learned of his family history. His antecedent history, regarding health, was good, regarding personal habits, very bad. He was addicted to intemperance, and was known as a "dead beat." For years he had been an outcast; was exposed to all kinds of weather,

and often for long periods was poorly nourished. The duration of the present illness is not known, but from his story and that of some cronies, he had been "going down" all spring. He had never received any injury. He was haggard and emaciated. He vomited once only, on the first day of admission. Marked ascites was observed, but nothing else noted. During the entire period he was under observation he lay in a perfectly apathetic, listless state, taking but little food and exhibiting no signs of suffering. At no time was there fever or sweats. Pain was absent. In addition to ascites, a painless, ill-defined tumor was observed in the epigastrium, and the spleen and liver were determined to be normal. The urine contained a small amount of albumen, but no casts were found. He never had any bloody discharges.

The ascites was so great as to warrant tapping, and this was accordingly done by Dr. Greenawalt, the resident physician. The abdomen was thirty-six inches in circumference at the umbilicus before tapping. Within eighteen hours succeeding the tapping, it had filled entirely, and in twenty-four hours measured thirty-six and a half inches. Without the development of further symptoms he died of exhaustion.

At the autopsy, it was learned by inspection that rigor mortis was present only in the inferior extremities, that post-mortem discoloration of the posterior portion of the trunk and the extremities, and of the neck and shoulders, was marked, that the body was emaciated and bloodless, the face bronzed, the abdomen distended, and the ankles slightly cedematous. By palpation a fixed mass was detected in the abdomen extending from the right mammary line, one inch above the umbilical level, directly across to the corresponding line on the left side. Its upper margin was not well defined, but it appeared to be two inches wide.

On section the abdominal cavity was seen to contain a large amount of clear serum, in which some lymph floated. The intestines were matted together by recent lymph; the parietal and visceral layers of the peritoneum were deeply injected, in parts the seat of small hemorrhages, in parts covered with light lymph. Corresponding to the position of the mass indicated by palpation, the omentum was found, matted together with its inferior border turned upward and lying across the stomach. This organ was fixed and dilated; its inferior border extended to the umbilicus; its pyloric orifice was seen two inches below the ribs in the right mammary line. The liver occupied its normal position. The transverse colon extended across the abdomen along the lower margin of the stomach, thus permitting the omentum to occupy the position indicated above.

Further study of the relations of the abdominal organs revealed the formation of a large cavity containing about a quart of pus. This cavity was formed by the posterior wall of the stomach in front, by the pancreas, the duodenum and transverse colon below, and by an extension of the peritoneum, or rather distention, behind and above. Certainly the pus did not fill the retro-peritoneal space or extend into it, and was not in close apposition to the diaphragm or brim. It was situated in the duodeno-jejunal fossa. Adhesions prevented communication with the abdominal cavity and the retro-peritoneal space.

The above indicated collection of pus was seen to communicate with a large abscess in the pancreas. This abscess was the size of an orange and was seated in the head of the organ, its points of rupture into the duodeno-jejunal fossa being in the middle and upper part. The re-



mainder of the pancreas was made up of dense connective tissue, throughout which there were innumerable pus pockets varying from a pea to a pecan nut in size. The secreting tissue of the organ was not discernible to the naked eye. The ducts were not occluded, but rather dilated, and calculi were not present. The pus was creamy and inodorous, and did not contain any curd-like masses. The portal vein folds of the peritoneum contained a considerable amount of fat, in which were readily detected hard cords representing branches of the superior and inferior mesenteric veins. In a section of the mesentery the vein was distinctly seen filled with clotted blood. The trunk of the portal vein was surrounded by dense fibrous tissue apparently of comparatively recent formation. The mesenteric branches, for a short distance, coursed through a similar structure. The thrombosis was due to the pressure of this adventitious formation, causing obstruction, but not occlusion, of the vein. On close examination of the portal vein its trunk was seen to contain a soft purulent clot, portions of which were free and portions adherent to the walls, which were inflamed, the intima being of a grayish-yellow color, roughened and opaque. No point of ulceration was found, and it was evident that inflammation had just commenced. The dilated hepatic branches of the portal vein were readily traced, and the same changes were present though, possibly, not so advanced. The splenic vein was partially occluded by a soft thrombus. The superior and inferior mesenteric veins were completely blocked by a firm, reddish-brown, laminated thrombus, which was removed with difficulty. In the proximal portions of the vein the centre of the clot was soft and yellow. The walls of the veins were undoubtedly thickened and the calibre increased.

The liver weighed three pounds and one ounce, and was normal in shape. The capsule was opaque, in parts thickened. On section its tissue resisted the knife, and the appearances indicated slight cirrhosis. Portions of the organ were congested. No abscesses were seen, but the portal vein, as noted above, was distinctly traceable, and almost to the periphery showed evidences of recent inflammation. Bile oozed from the cut ducts. The hepatic artery and its branches were unusually prominent. The gall-bladder was distended with unusually fluid bile; the ducts were pervious.

The stomach was dilated. The mucous membrane was intensely congested, mammillated, and in numerous points the seat of submucous ecchymoses due to infarcts. The entire surface was covered with mucus.

As previously noted, the peritoneum covering the intestines presented a high degree of inflammation. The mucous membrane of the large and small intestine was intensely congested; the glands were not enlarged; ulcers were not found; hemorrhagic infarcts were very numerous in the course of the small intestines.

The kidneys were slightly congested and fatty. The capsule was readily removed. The cortical portion was normal.

The spleen was under size, soft in texture, but apparently normal. The suprarenal bodies were normal.

The pleural cavity did not contain serum. The right lung was the seat of hypostatic congestion behind; its apex was adherent; corresponding to the adhesions, punctured cicatrices were noted, with areas of sclerosis in the parenchyma. No cavity was observed. The left lung was congested. Mediastinal glands normal. The heart weighed five and a half



ounces. The posterior leaflets of the aortic valve were fused. The mitral valves were thickened, and the anterior leaflet was contracted. One leaflet of the pulmonary valve was somewhat thickened and indurated.

Brain and spinal cord not examined.

On microscopical examination the pancreas was found to be made up of old and young connective tissue; in the large interstices of the bundles of old tissue, the glandular structure of the pancreas could be readily made out, and the tubules were seen to be in a state of catarrhal inflammation. The intertubular connective tissue was crowded with young cells.

The liver was highly fatty; surrounding the portal vein a crowding of young connective tissue elements was observed, invading the interlobular spaces and extending between the hepatic cells. Sections of one of the branches of the vein which was the seat of thrombus showed an endo-phlebitis of somewhat long standing. The walls of this vein were thickened. The endothelial cells of the intestine were abundantly proliferated. The muscular wall was hypertrophied, and showed slight leucocytic infiltration. The young cell infiltration was, however, much more marked in the adventitia, and extended into the surrounding peritoneal structure. The endothelial overgrowth penetrated somewhat into the clot, which, however, showed no attempts at organization, and was merely a laminated, compact mould of corpuscles entangled in fibrin. Some necrotic changes were observed in the centre of the clot.

The *clinical indications* of abscess of the pancreas in this case, as frequently occurs, were so meagre that the revelations of the autopsy were surprising; and when one observes the extensive disease and alteration of structure, the wonder is not that the abscess was not recognized, but that it could be present with so little discomfort to the patient. The pain, the gastric disturbance, and the fever frequent in abscess in this situation were absent entirely. Emaciation, constipation, a tumor, and pressure symptoms were present, it is true; symptoms and signs, however, due to so many causes so much more common than pancreatic disease, and which affection quite plausibly, therefore, was excluded.

The latency of the symptoms appears to point to the chronicity of the abscess. The histological appearances of the pancreas, and the sequence of the pus formation, peritoneal adhesions, and thrombosis (from pressure), confirm this view.

Reviewing the symptoms present during life in the light of the post-mortem study, some interesting features may be glanced at. The emaciation was very decided, and although almost always present in disease of the pancreas, was thought to be due to want of food and to gastritis and cirrhosis of the liver. Had the intestinal symptoms of pancreatic disease been present, some other explanation for the emaciation would have been given. But constipation was present, and this is often the case in this disease. Its presence alone, however, was not sufficient to point to a correct diagnosis, while it is true the absence of fatty diarrhoea did not permit us to exclude lesions of the pancreas.

Nor was the doubtful presence of a tumor a sufficient indication of the disease. Its ill-defined character, amounting at times only to a sense of resistance, its nearness to the surface, and its painless nature, left one in doubt as to its nature, and certainly did not warrant the consideration of its being the pancreas. The autopsy showed it was due to the omentum, which had been involved in and fixed by inflammatory adhesions.

The pressure symptoms sometimes present in disease of the pancreas, caused in this case the venous thrombosis and consequent ascites. The ascites was thought due to hepatic cirrhosis, but it differed from the ordinary serous accumulation of that disease in rapidly returning after tapping. The absence of enlarged spleen, of enlarged veins in the abdominal walls, and of the diarrhœa and gastric symptoms of portal occlusion, would lead us to exclude that affection. The autopsy showed that the one symptom, ascites rapidly recurring, is sufficient for one to infer its presence.

Roberts (*Quain's Dictionary*) tells us that patients suffering from grave pancreatic disease are often low spirited and despondent, although he doubts the truth of the relationship. Apathy and despondency were quite marked in this case, but might be explained in other ways. In my notes of the autopsy it may be seen that a bronzing of the skin of the face was observed. This has been seen in other cases of pancreatic disease in which the sympathetic system was anatomically involved. Our dissection showed the matting together and involvement of the solar plexus in the diseased process.

It is to be regretted that the urine was not examined for sugar, although it has not usually been present in similar cases. It is worthy of record that, in spite of the severe gastric catarrh, sialorrhœa was absent.

Pancreatic disease occurs most frequently in men, in the middle or later periods of life, and in those of strumous diathesis. A predisposing tendency may be inherited. Alcoholism and mechanical injury are exciting causes of the inflammatory changes. The habits of our patient would appear to confirm this one point. The sex and the age correspond to the usual statistics.

It may be gathered from the preceding remarks that the diagnosis of the patient's affection was cirrhosis of the liver. Even with the most careful scrutiny, it appears to me there were not sufficient grounds for making any other diagnosis. The habits and age of the patient, the emaciation, the anorexia, the ascites, and the absence of renal and cardiac disease, would direct our attention to this hepatic lesion. From the preceding review of the clinical history of this case, the following train of symptoms would permit us to infer that some form of pancreatic disease was present. They are progressive emaciation, despondency, bronzing of the skin, without the asthenia of Addison's disease, constipation, and

thrombosis of the portal vein. In the latter instance other causes of thrombosis must be excluded. If the other symptoms of thrombosis, viz., diarrhœa, enlarged superficial veins, and enlarged spleen, be present, I cannot see how a differential diagnosis from hepatic cirrhosis could be made. A long duration of the disease and the physical signs of cirrhosis of the liver, both uncertain elements, would favor that affection.

The comparatively slight alterations in the hepatic structure lead one to infer that portal obstruction was not of very long duration. Phlebitis of the portal vein and its hepatic branches was certainly comparatively recent. It is of interest to note that, in spite of the cutting off of a considerable amount of blood supply, bile was freely secreted. The enlarged hepatic arteries are evidence that this vessel compensated for the loss of portal radicles. The thrombus, from its laminated appearance, formed slowly, no doubt; on account of pressure on the vessel the blood current was slackened. The dissection distinctly showed that there was no pressure on the splenic or gastric vessels, and hence the absence of the symptoms thereof. It is to be regretted that the course of the collateral circulation was not observed.

The rupture of the pancreatic abscess and its limitation to the duodeno-jejunal fossa are believed to be unique. So far as I have examined the subject, a similar case has never occurred. Treves, in his lectures on the anatomy of the peritoneum, states that this fossa is of no practical importance and is not concerned in the production of internal hernia. On the other hand, Allen (*System of Anatomy*) quotes Treitz, who believes many cases of retro-peritoneal hernia have their point of origin in this locality. A number of other authorities quite agree with Allen. None of them refers to abscess in this locality.

Nothing has been said of the peritonitis. It was, no doubt, due to extension from the pancreas. It did not present any clinical phenomena during life, save the previously noted tumor. The excessive gastric catarrh was due more probably to the habits of the patient than to any effects of obstruction of the gastric vein. The intestinal catarrh was, no doubt, due to the venous thrombosis.

Complicated as this case was, I will finally observe, how much more complicated it would have been had the abscess burrowed into the retro-peritoneal space down to the groin or to the buttock. Verily, the problem of the recognition of disease of the pancreas has not been solved.

What means could have been employed to cure our patient? Had the diagnosis been made, unquestionably, laparotomy should have been performed, and one can see that it alone could have been of service. Without a definite diagnosis, in this advanced day of abdominal surgery, an exploratory operation should have been done. Since the admirable paper of Senn, it would be culpable to neglect resorting to operative measures for certain diseases of the pancreas.

In conclusion, it may be stated, from the present study, that abscess of the pancreas may occur in persons of intemperate habits, of the male sex, and after the age of forty. It may be almost entirely latent, or present the only positive symptoms of emaciation, constipation, and pressure phenomena, and, doubtfully, of despondency and skin bronzing.

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## ON SOME POINTS IN THE PRACTICE OF ARTIFICIAL RESPIRATION IN CASES OF STILLBIRTH AND OF APPARENT DEATH AFTER TRACHEOTOMY.

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THE subject of artificial respiration is naturally preceded by a few words on stillbirth. That the popular use of "stillbirth" as synonymous with "deadbirth" is incorrect, is proved by the generally used and quite correct phrase "resuscitation of stillborn children." If the children are dead, they obviously cannot be resuscitated. Again, the phrase cannot mean birth without any of the signs of life, for, speaking generally, the heart is beating. The expression, then, practically comes to mean birth without obvious movements, whether of respiration or of other kinds. This, after all, is the plain meaning of the word "still." All deadborn children are therefore stillborn, but all stillborn children are not deadborn.

A child born alive but "still"—that is, generally, but not necessarily, with its heart beating, but without movement—may be in one of two stages or states, for the description of which we are indebted to Cazeaux.<sup>1</sup> In the first, which he calls the "apoplectic state," the surface is livid, but the muscular tone is not lost, and there is no response to reflex irritation. In the second, which he calls "syncope," the surface is pale, the muscular tone is lost, and there is no response to reflex irritation. These two states are also known as the livid stage and the pale or flabby stage of asphyxia.

The relation of these two stages to each other is not finally determined. It is known that the head of the fœtus is subjected to great pressure in its passage through the genital canal, and that hemorrhages into the brain and spinal cord are so commonly<sup>2</sup> found in the bodies of children born dead or dying soon after birth, that it is probable that such hemorrhages are by no means invariably fatal. No necessary con-

<sup>1</sup> Cazeaux, *Gaz. méd.*, 1850, No. 17, p. 317, and *Traité des Accouchements*, Bruxelles, 1845, p. 34.

<sup>2</sup> Litzmann, *Die Geburt bei engen Becken*, Leipzig, 1884 (passim).



nection apparently exists between serious lesions of this sort and still-birth, in the sense that in cases of dangerous stillbirth such lesions are necessarily present. Moreover, the worst cases of both varieties occur where the head is born last, and has, therefore, suffered less pressure than usual.

The state of asphyxia at birth is an exaggeration of the state of strong "necessity of breathing," which is normally produced during labor. As the intrauterine pressure rises, and the placenta is pressed upon with increasing force, as the placental site diminishes with uterine retraction, the foetal circulation becomes progressively embarrassed, the external sign of which is retardation of the foetal heart. The complete or virtual abolition of the placental circulation which generally ensues on the completion of the birth of the child, and the shock of the relatively cold air, may either of them be competent to excite the first inspiration. Sometimes, however, matters have gone further, and the child is too asphyxiated for the moment to be roused. On the other hand, pressure on the cord, or separation or great squeezing of the placenta (such as occurs in head-last cases, when the head is in the vagina, and the uterus is already in the third stage of labor before the child is born) may excite premature inspiratory efforts, convulsive in their nature, which may draw any matters in the genital passages, such as liquor amnii, vernix caseosa, and meconium, not only into the trachea, bronchi, and air cells, but even beneath the pleura. In such a case the child, resuscitated it may be, dies of a low form of lobular pneumonia.

The length of survival of apparently dead children is sometimes remarkable, as the following instances, in which children have been buried apparently dead, and afterward dug up and restored to life, show.<sup>1</sup> Two illegitimate children of separate mothers were buried, and restored to life after several hours' burial. A child was buried five hours, restored to life, and lived three days.<sup>2</sup> A child was buried in a field twenty-five centimetres below the surface during eight hours; it lived four days after its disinterment.<sup>3</sup> A child was born apparently dead; attempts to revive it proving fruitless, it was laid on a bed for several hours, and then put in a coffin. Twenty-three hours after birth it was seen, and, to make matters certain, the stethoscope was applied to the cardiac region, and heart sounds were heard. All attempts to revive it, however, failed, and it died. Such a case as the last suggests the greatest caution, the more so as the body has been opened under similar conditions, and the heart found beating.

The *prognosis* in cases of stillbirth is of the utmost importance as a guide to treatment, but it is not usually made. To attempt to resuscitate

<sup>1</sup> Bohn, "De officio medici forensis," S. 262 (quoted by Schultze).

<sup>2</sup> Bardinet, Bull. de l'Acad. Imp., tom. xxx, p. 1052, No. 21, 15 août, 1865 (quoted by Schultze).

<sup>3</sup> Maschka, "Das Leben der Neugeborenen ohne Athmen," Prager Vierteljahrsschrift, 43, p. 1, 1854.

a child which is actually dead is useless; though, if the child is fresh, attempts may even here be made for a short time, for the satisfaction of the parents. The certainty of death in the case of fresh children depends on the certainty of the cessation of the heart's action during a considerable period, for the heart may cease to beat for a time, apart from absolute death. In such a case, when the heart has ceased to beat for a considerable time (say ten to fifteen minutes), it might be well cautiously to insert a needle into its apex, before abandoning all efforts at resuscitation.

The question here arises, How long should attempts at resuscitation be continued on the sole ground of the persistent action of the heart? A child whose neck is broken, and who dies eventually with considerable effusion of blood into its spinal cord and brain, has been yet revived and lived for several hours. The case above quoted, in which the heart was found beating twenty-three hours after supposed death, should also be borne in mind. In children who eventually die, the heart revives for a time under artificial respiration, and can be kept beating for some (*e. g.*, two) hours, though the child never draws a breath. Such a case, however, is practically hopeless. It may be stated that if no attempts at spontaneous breathing occur within an hour, and especially if the heart, in spite of artificial respiration, acts with diminishing strength and frequency, the prognosis becomes hopeless.

The second point in the prognosis depends on the diagnosis of the state of asphyxia. In the livid stage the prognosis is usually favorable. It is in itself the less serious form, and possesses the great advantage of retaining the power of reflex excitability. If the heart is beating fairly, it is often sufficient to lay the child on its face, wipe out its mouth, and rub it along the spine, a far better way of exciting an inspiration than slapping the nates. A livid color in a stillborn child is, therefore, a good sign. In the pale or flabby stage of asphyxia the prognosis is far more serious. These are the cases which require all the skill at our disposal, while the slight cases will recover under any treatment, and generally better without any artificial respiration at all; it is these latter cases which form the bulk of those recorded in the journals as "successful treatment of suspended animation by a new method."

In the cases of pale or flabby asphyxia, the prognosis depends on our power to raise the child out of its flabby condition, and render it amenable to reflex irritation. Until this is done, all rubbing, slapping, bathing, etc., are simple waste of time. While the heart beats regularly, we may still hope for recovery up to a reasonable length of time, as we have observed above.

The state of the pupils furnishes an important element in prognosis. In profound asphyxia they are widely dilated, as in death. The re-

establishment of the circulation produces no effect on them, but on the reestablishment of respiration they at once contract.<sup>1</sup>

If the child is breathing, its respiration may be spasmodic, regular, or mixed, periods of spasmodic and regular respiration alternating. The spasmodic respiration is imperfect respiration, but is gradually replaced in most cases by rhythmical respiration, and the prognosis is good. If spasmodic breathing replaces regular breathing, the reverse is, of course, true.

A few words may here be said on the vexed question of the treatment of the navel-string. It appears that a child gains some four to six ounces of blood after birth, the principal object of which is probably to furnish an additional supply for the newly established pulmonary circulation. This blood is not forced into its body so much as drawn into it by the first inspirations. To deprive a child of seven ounces weight of this amount of blood is the same thing as to deprive an adult, weighing ten stone, of five to seven and a half pounds of blood—a very serious bleeding. In ordinary cases, therefore, it is best to tie the cord late. In cases of asphyxia the same rule holds good, unless manipulations are indicated which require the child to be free from its mother.

It has been recommended, in cases of livid asphyxia, to allow half an ounce to an ounce of blood to escape from the cord. This treatment is probably founded on the full-blooded appearance of the child. The child, however, has *less* blood than it should eventually have, and has no more than a child in the pale stage, the difference being one in the distribution rather than the amount of blood. Remembering that these livid children generally recover, and that the treatment has never been suggested for the pale children, who are the really serious cases, it is probably best, in the meanwhile at least, not to bleed.

The color of the skin, and especially of the lips, is important, whether tending to lividity or to pallor, and a favorable change often precedes the establishment of respiration.

With regard to artificial respiration, it may be stated that four objects are aimed at, namely:

- (1) Removal of foreign bodies from the air-passages;
- (2) Procuring the patency of the air-passages;
- (3) Excitation of the circulation;
- (4) Ventilation of the lungs.

(1) With regard to the first,<sup>2</sup> the mouth, and, as far as possible, the air-passages, should be cleared before inspiratory movements are excited, in order to prevent the liquor amnii, meconium, vernix caseosa, and other matters from being inhaled into the lungs. The best method to pursue is the following: Lay the child on its back, with the head hang-

<sup>1</sup> Boehm, Arch. für exp Path. und Pharm., Bd. viii. S. 91.

<sup>2</sup> Med.-Chir. Trans., vol lxvii. pp. 105-113, 1884.



ing over the edge of a table, a little lower than the rest of its body. Wipe out the mouth with a soft handkerchief. Press the thorax gently with one hand, stroking the trachea upward with the other, and retain the finger at the top of the trachea until the next manœuvre is complete. The mucus will gravitate toward the posterior nares. Put a handkerchief over the child's mouth, blow gently, and the mucus will be blown out of the nostrils, but not into the operator's face.<sup>1</sup>

If there is great accumulation of mucus in the air-passages, a No. 9 gum-elastic male catheter should be introduced into the trachea, so that the point is three and a half inches from the lips. This length will secure its passing through the glottis, but not as far as the bifurcation of the trachea. Press the thorax gently with one hand to prevent the entrance of air, and blow through the catheter. The opening being low down in the trachea, the air and mucus with it being unable to pass into the lungs on account of its compression by the hand, will rush up through the glottis, and the mucus will be blown into the pharynx. This can be repeated as often as necessary, the general tendency of fluids in the air-tubes being to ascend during respiration, whether natural or artificial, toward the mouth. This manœuvre is more efficient and far pleasanter than the suction usually recommended; it has answered well in practice.<sup>2</sup>

(2) With regard to securing the patency of the air-passages; this is often the greatest difficulty in artificial respiration, particularly where the child is deeply asphyxiated, and the divaricator muscles of the glottis seem to share the general flaccidity of the muscles of the whole body.<sup>3</sup> All methods of artificial respiration by manipulation, except that of Schultze, seem to be often useless, on account of this condition; the method of Schultze, however, seems by some means to render the air-passages patent in many cases where they have remained closed during other manipulations.<sup>4</sup> To pull the tongue forward with forceps is useless, as it does not affect the structures at the base of the tongue, and does not raise the epiglottis. The manœuvre of tilting up the chin with the mouth closed, however useful in adults, permitting respiration solely through the nose, as it does, cannot be of the same use in stillborn children, whose pharynx and air-passages are filled with mucus, and in whom the removal of mucus is one of the great desiderata.<sup>5</sup> Hanging the head backward over the edge of a table does not provide for the patency of the upper air-passages.<sup>6</sup> If difficulty is persistently experienced, a catheter can be introduced into the trachea, and secured at the proper length of three and a half inches, so that it may not slip too far in, or slip out during manipulations. While in the trachea it serves for various purposes, among which is the removal of mucus as described

<sup>1</sup> Med.-Chir. Trans., vol. lxvii. p. 110, 1884.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid., p. 109, 1884.

<sup>6</sup> Howard, Lancet, May 22, 1880, p. 797.



above. During artificial respiration fluid will often pour from the catheter, especially if it is held over the edge of the table like a siphon.

(3) The third object, excitation of the circulation, is generally dependent on the fourth, namely, ventilation of the lungs.<sup>1</sup> But pressure over the præcardium has a direct effect in raising the blood-pressure and exciting the action of the heart. This is probably the chief reason for any success obtained by the methods of Howard and Marshall Hall, which are powerless<sup>2</sup> to introduce air into the lungs of stillborn children. It has been said that it is undesirable to excite the circulation in deeply asphyxiated children, since the blood which is supplied to the body is necessarily impure. This objection, however, is theoretical, the truth being that the revival of the circulation gives the best prognosis for the establishment of respiration.

(4) The ventilation of the lungs is secured by various methods of manipulation, of which, for stillborn children, only two are trustworthy,<sup>3</sup> namely, the method of Schultze, and that of Silvester, with its modifications by Pacini and Bain.<sup>4</sup> It may be said at the outset that the method of Silvester (and its modifications), though the best for general purposes, by no means imitates the natural breathing of an infant, which is diaphragmatic.<sup>5</sup> In the method of Schultze, on the other hand, the diaphragm descends, though but slightly. The chief effect of both methods is to raise the upper part of the thorax. There remains the method of mouth-to-mouth inflation, the object of which is to fill the lungs once for all.

These methods will now be described.

A. The method of Schultze.<sup>6</sup> The navel-string being tied, the child is seized with both hands by the shoulders in such a way that both thumbs lie on the anterior wall of the thorax, both index fingers extend from behind the shoulders into the axillæ, and the other three fingers of both hands lie obliquely along the posterior wall of the thorax. The head is prevented from falling by the support of the ulnar sides of the two hands. The operator stands with somewhat separated legs, and bends slightly forward, holding the child, as above described, at arm's length, hanging perpendicularly. (*First position, inspiratory.*)

Without pausing, he swings the child upward from this hanging position at arm's length. When the operator's arms have gone slightly beyond the horizontal, they hold the child so delicately that it is not violently hurled over, but sinks slowly forward and forcibly compresses the abdomen by the weight of its pelvic end. (*First movement, expiratory.*) At this moment the whole weight of the child rests on the operator's thumbs lying on the thorax. (*Second position, expiratory.*)

<sup>1</sup> Boehm, loc. cit., S. 72 et seq.

<sup>2</sup> Med.-Chir. Trans., vol. lxiv p. 85, 1881.

<sup>3</sup> Ibid., pp. 85, 86.

<sup>4</sup> Ibid., p. 79.

<sup>5</sup> Ibid., pp. 64, 65, 82.

<sup>6</sup> Schultze, Der Scheintod Neugeborener, Jena, 1871, S. 162. Ibid., p. 48.

Any compression of the thorax by the hands of the operator must be carefully avoided. The body of the child rests during the first position with the floor of the axillæ on the index fingers of the operator exclusively, and no compression should be exercised on the thorax in spite of the support of the hands to the head, nor should the thumbs compress the thorax in front. When the child is swung upward the spinal column should not bend in the thoracic, but only in the lumbar region, and the thumbs should not at this time strongly press the thorax, but should only support the body as it sinks slowly forward. The raising of the body as far as the horizontal should be effected by a powerful swing of the arms (of the operator) from the shoulders, but from that point the arms should be raised more and more slowly, and by means of a delicately adjusted movement of the elbow-joints and scapulæ on the thorax, the pelvic end of the child should fall gradually over. By this gradual falling of the child's pelvis over the belly, considerable pressure of the thoracic viscera is exercised, both against the diaphragm and the whole thoracic wall. At this point the inspired fluids often pour copiously from the respiratory openings. After the child has slowly but completely sunk over, the operator again lowers his arms between his separated legs. The child's body is thereby extended with some impetus; the thorax, released from all pressure (the operator's thumbs lying now quite loosely on the anterior walls of the chest), expands by means of its elasticity, but the weight of the body hanging, as it does, on the index fingers of the operator by the upper limbs, and thus fixing the sternal ends of the ribs, is brought into use for the elevation of the ribs with considerable impetus; moreover, the diaphragm descends by virtue of the impulse which is communicated to the abdominal contents.

(*Second movement, inspiratory.*) After a pause of a few seconds, in the first inspiratory position, the child is again swung upward into the previous position (*first movement, second position, expiratory*), and while it sinks slowly forward it brings its whole weight to bear on the thumbs, which rest on the anterior thoracic wall, and mechanical expiration again ensues. At this point any inspired fluids always pour copiously from the mouth and nose, and generally meconium from the anus. The proceeding is repeated eight or ten times a minute, but more slowly when the inspired fluids flow from the mouth and nose.

It is most important that at the end of the respiratory movement the weight of the child's body should be entirely thrown on the index fingers placed in the axillæ, and none of it supported by the rest of the hand.

Schultze's method has the disadvantage of being more<sup>1</sup> sudden and violent than some of the other methods, but this can be largely con-

<sup>1</sup> Med.-Chir. Trans., 1881, vol. lxiv. p. 81.

trolled by the operator. On the other hand, it possesses two great advantages: the first is, that in the expiratory position the child is inverted, and gravity assists in removing mucus and other bodies from the air-passages; the other is, that for some reason it does sometimes actually provide patency of the air-passages where other methods fail.<sup>1</sup>

The method of Schultze has recently been assailed on the ground that it fails to introduce air into the lungs. It would be very difficult to devise an experiment which would prove or disprove this.

In the experiments on stillborn children referred to above, tracheotomy had been performed and a canula tied into the trachea, which really removes the chief impediment to the introduction of air in actual practice, such impediment concerning almost exclusively the upper air-passages. As regards the results of autopsies, it must be remembered that the presence of a certain amount of air in the lungs of a stillborn child would not prove its introduction by artificial respiration, since the lungs of children dying *intrapartum* are not necessarily airless,<sup>2</sup> but complete, or even considerable expansion of the lungs of a stillborn child after artificial respiration would certainly prove that air had been introduced by such artificial respiration. It is doubtless true that in some cases all methods will fail, and that all manipulative methods often fail in the case of premature or undersized infants, unless, indeed, the patency of the upper air-passages is secured. It is not enough to prove that in some cases a method succeeds—what is desired is to know the best methods and what to expect of them. The result of considerable experience of all methods of artificial respiration in practice has been to assign to Schultze's method one of the highest places as a means of securing the ventilation of the lungs, and the highest place among manipulative methods as a means of securing patency of the upper air-passages.<sup>3</sup>

B. The method of Silvester,<sup>4</sup> recommended by its author for children and adults: (1) To adjust the patient's position, place the patient on his back, with the shoulders raised and supported on a folded article of dress; (2) to maintain a free entrance of air into the windpipe, draw the tongue forward; (3) to imitate the movements of respiration raise the patient's arms upward by the sides of his head and then extend them gently and steadily upward and forward for a few moments, next turn down the patient's arms and press them gently and firmly for a few moments against the sides of the chest; (4) the feet are to be

<sup>1</sup> Med.-Chir. Trans., 1884, vol. lxxvii. p. 109.

<sup>2</sup> Schwartz, Die vorzeitigen Athembewegungen, Leipzig, 1858, S. 136 (Cases 15 and 30). Schultze, loc. cit., S. 132 Hecker, Virch. Arch., 1859, xvi. S. 534.

<sup>3</sup> Med.-Chir. Trans., 1884, vol. lxxvii. p. 109.

<sup>4</sup> Silvester, "The true physiological method of restoring persons apparently drowned or dead, and of resuscitating stillborn children," 1858, p. 17. Med.-Chir. Trans., 1881, vol. lxxiv. p. 46.

secured, and the arms are to be stretched steadily upward for two seconds.<sup>1</sup> The arms should, if possible, be everted, which gives a greater inspiratory power, by rendering more tense the tendon of the pectoralis major muscles, and they should be seized above the elbow.

The modifications by Pacini and Bain are as follows. That by Pacini<sup>2</sup> is thus described:<sup>3</sup> The feet of the patient being fixed, the operator stands with the head against his own abdomen, and then with his hands takes a firm hold of the upper part of the arms, applying the forefingers behind and close to the armpits, while the thumb is in front of the head of the humerus. Holding the shoulders thus, he pulls them toward him, and then lifts them in a perpendicular direction.

Bain's modification<sup>4</sup> is the following.<sup>5</sup> First method: The fingers are placed over the front of the axillæ, the thumbs over the ends of the clavicles; the operator then draws the shoulders upward and then relaxes his traction. Second method: The shoulders are raised by taking hold of the hands and raising the body about a foot off the table, the position of the arms being at an angle of about forty-five degrees beyond the head. These modifications present no practical advantages over the original method of Silvester for children; in adults they seem to increase slightly the amount of air inspired.<sup>6</sup>

The advantages of Silvester's method are its simplicity and the comparatively large amount of air which it is capable of drawing into the lungs. Its disadvantages are that the supine position of the patient impedes the escape of mucus and other matters from the mouth, and also the fact<sup>7</sup> that it frequently happens that the collapsed state of the upper air-passages prevents the introduction of any air into the lungs.

The methods of Marshall Hall<sup>8</sup> and Howard<sup>9</sup> are incapable of introducing any air into the lungs of a stillborn child, because the chest has no resiliency, and any effect they may ever produce in resuscitating still-born children must be produced by pressure on the heart, which has the power of stimulating its action and raising the blood-pressure.<sup>10</sup>

We have now to say a few words on direct inflation of the lungs. Various curved canulas have been invented for this purpose, especially in France, but we cannot recommend their addition to the already large armamentarium of the accoucheur; and, if used at all, they must be constantly carried, for their need arises unexpectedly. The best method is that by the mouth. The operation may be rendered clean by the simple method of laying a towel over the child's mouth and breathing through

<sup>1</sup> Med.-Chir. Trans., 1881, vol. lxiv. pp 79 and 86.

<sup>2</sup> Ibid, 1881, vol. lxiv. p. 47.

<sup>3</sup> Pacini, "Di un novo Metodo di praticare la Respirazione artificiale," Firenze, 1867.

<sup>4</sup> Med.-Chir. Trans., 1881, vol. lxiv. p. 47.

<sup>5</sup> Bain, Med. Times and Gazette, Dec. 19, 1868, p. 708.

<sup>6</sup> Med.-Chir. Trans., 1881, vol. lxiv. p. 75.

<sup>7</sup> Ibid, 1884, vol. lxxvii. p 109.

<sup>8</sup> Ibid., 1881, vol. lxiv. p. 78.

<sup>9</sup> Ibid., p. 77.

<sup>10</sup> Boehm, Arch. für exp. Path. und Pharm., Bd. viii. S. 91.



it. The disadvantages of direct mouth-to-mouth inflation are alleged to be the following: (1) Danger of rupturing the lungs; (2) danger of tubercular infection from the operator; (3) danger of inflating the stomach, and so preventing inspiration by impeding the descent of the diaphragm.

The first can be avoided by gentleness in inflating, and also by leaving the nose free.<sup>1</sup> To close the nostrils, as is often recommended, is useless and dangerous—the nostrils are a valuable safety-valve. The second is founded on an observation by Reich,<sup>2</sup> relating to a consumptive midwife who practised inflation. In thirteen months twelve children delivered by her were attacked with symptoms of bronchial catarrh with fever, and died of tubercular meningitis. The children had no phthisical family history. During the same period the other midwife of the place had no cases of tubercular meningitis. In the nine years previous to the practice of the phthisical midwife there had been only two cases, and in the year after her death only one.

In view of recent researches on tubercle, the above has at least to be remembered. The third is imaginary, so far as artificial respiration is concerned;<sup>3</sup> air in the stomach is no way diminishes the amount of air which can be introduced into the lungs by the artificial methods, and it is easily pressed up from the stomach.

It has been suggested that the entrance of air into the stomach can be prevented by pressing the cricoid cartilage against the bodies of the vertebræ, and also by bending the head well back.<sup>4</sup> Neither of these plans produces the desired effect in children, though the former succeeds in adults.<sup>5</sup>

It remains for us to say a few words on the action of heat. In this matter it is necessary to keep apart the two questions of (*a*) recovery to respiration, and (*b*) avoiding chills. It has been proved that, within limits,<sup>6</sup> the lower the temperature the longer can an animal survive without breathing, and the higher the temperature the more quickly it dies. To keep a child in a hot bath until respiration is established is, therefore, a wrong practice. The hot bath can, however, be advantageously used in alternation with the cold bath, but merely as a means of increasing the effect of the cold bath, and in the pale (flabby) stage of asphyxia this also is useless. Under such circumstances it is best to wrap the child in a warm flannel, and not to waste time on baths, but to proceed at once to the establishment of respiration. The application of warm flannels to the head, which is a valuable nervous stimulant in the case of adults, may be advantageously tried in the case of infants, so soon as any signs of reflex action appear, or even possibly earlier.

<sup>1</sup> Med.-Chir. Trans., 1884, vol. lxxvii p. 111.

<sup>2</sup> Reich, Berl. klin. Woch., 1878, No. 37.

<sup>3</sup> Med.-Chir. Trans., 1884, vol. lxxvii p. 107.

<sup>4</sup> Ibid., p. 108.

<sup>5</sup> Ibid., p. 107.

<sup>6</sup> W. F. Edwards, Annales de Chimie, 1818, tome viii. série 2, p. 225.

To sum up the treatment, we may say: Never hurry, it is not a question of seconds, and success depends upon a fine exercise of the judgment. Make a good diagnosis, first, as to life or death; secondly, as to the stage of asphyxia (if life is not extinct). If the child is macerated, it is obviously dead and past hope. If the heart beats, ever so slowly and feebly, it is not dead. If the heart is not beating, death is not certain, unless it can be proved to be inactive for some time. If the child is livid and not flabby, it will probably come round; wipe out its mouth and pharynx, and rub it with a soft cloth down the spine, press gently on the cardiac region. If this produces no effect, inflate the lungs by the mouth, and then by Silvester's method. If air enters the lungs, well and good; if not, try Schultze's method, or insert a catheter, as described above. On the first sign of muscular action, plunge the child into cold water, or into alternate hot and cold baths. Vary the treatment between occasional inflation of the lungs, artificial respiration, pressure over the cardiac region, baths, irritation down the spine, according to the judgment; remembering what may be expected of each method, and that no one will suffice for all cases. Watch for signs of resuscitation, namely, improvement in the color, in movements, in cardiac pulsations, as described above. Never be content until the child breathes regularly, and appears to be continually improving.

Most of the above directions apply to persons apparently drowned. For them, Silvester's method is the best; the air-passages are less likely to be closed, and the mechanism of artificial respiration works better. On the other hand, they have not nearly the tenacity of life of babies, and the hope of recovery in the absence of signs of life is far less.

As regards the parts of the lungs expanded or unexpanded most commonly by artificial respiration, the following are the facts:

(1) The right lung is more usually and more completely expanded than the left. (2) The anterior surfaces are more usually and more completely expanded than the posterior. (3) The apices of the upper lobes are often unexpanded. (4) The same may be said of the anterior inferior borders. (5) One of the places of selection for atelectasis is a strip running vertically along the angles of the ribs on each side of the spine. (6) The patches of expansion or atelectasis, when considerable, are not confined to lobes nor bounded by fissures. (7) The last circumstance is not due to obstruction of the bronchi. (8) The spots of predilection for expansion or atelectasis underlie the regions of greatest and least movement of the chest-walls.<sup>1</sup>

Artificial respiration sometimes becomes necessary after tracheotomy. Under these circumstances, I have proved<sup>2</sup> (1) that emphysema of the anterior mediastinum occurs in a certain number of cases. At the

<sup>1</sup> Med.-Chir. Trans., 1881, vol. lxiv. p. 100.

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<sup>2</sup> Ibid, 1882, vol. lxxv. p. 85.

Children's Hospital, in sixteen out of twenty-eight cases in which autopsies had been made after tracheotomy, occurring during two years, or in fifty-seven per cent., emphysema of the anterior mediastinum was found.<sup>1</sup> (2) Emphysema of the anterior mediastinum is often associated with pneumothorax, to which it stands in causal relation, and which may be the cause of death after tracheotomy. In two of the cases above referred to, in which autopsies were held after tracheotomy, pneumothorax was found.<sup>2</sup> It was found in no case without emphysema of the mediastinum. The amount of emphysema of the mediastinum was greatest when pneumothorax existed also. In many, if not in all of these twenty-eight cases, artificial respiration had been performed. (3) The air is most likely to burst into that pleura of which the lung is the less expanded. On the other hand, pneumothorax of course helps to collapse the lung. (4) The route selected by the air is the space beneath the deep cervical fascia. (5) Emphysema of the anterior mediastinum may or may not be associated with emphysema of the neck; but their causes are different, and the conditions of their production are opposite. (6) The conditions favoring the production of mediastinal emphysema are division of the deep cervical fascia, obstruction to the air-passages, and inspiratory efforts. (7) The dangerous period during tracheotomy is the interval between the division of the deep cervical fascia and the efficient introduction of the tube. (8) The incision in the deep cervical fascia should not be longer than necessary in the direction of the sternum. It should on no account be raised from the trachea, and this should be particularly remembered during inspiratory efforts. (9) It will probably be found that the frequency of occurrence of emphysema of the anterior mediastinum depends much on the skill of the operator, especially in inserting the tube. (10) If artificial respiration should prove necessary, the tissues should be kept in apposition with the trachea, and any manipulations performed steadily and without jerks. (11) Schultze's method (which is not otherwise suitable for the above purpose) is especially prone to produce emphysema of the anterior mediastinum. (12) These observations illustrate the fact that, apart from the question of tracheotomy, the inspiratory force of the thorax should be remembered in all operations near the root of the neck, whether dealing with vessels or not, and in the case of all collections of pus beneath the deep cervical fascia. In these cases quiet respiration is essential for the safety of the patient, and vomiting, which begins with a sudden inspiration, is dangerous.

The passage of the air from the tracheotomy wound along the anterior mediastinum illustrates the production of emphysema of the neck during labor and during violent expiratory efforts.<sup>3</sup>

I have proved that (1) the cause of emphysema of the neck during

<sup>1</sup> *Med.-Chir. Trans.*, 1884, vol. lxxvii. p. 102.

<sup>2</sup> *Ibid.*, p. 102.

<sup>3</sup> *Ibid.*, 1885, vol. lxxviii. p. 66.

labor is rupture of the lung tissue, the air escaping near the root of the lung, passing beneath the pulmonary pleura into the anterior mediastinum, and so beneath the deep cervical fascia into the neck. The route thus marked is the same by which air sometimes passes into the anterior mediastinum after tracheotomy. (2) The weakest parts of the lungs are opposite the pleural reflections (that is, the fissures) and the interlobular spaces. The anterior surface of the root of the lung is the weakest spot while the lungs are within the thorax, being that pleural reflection lying within the comparatively unsupported area near the upper aperture of the thorax. (3) Pneumothorax, when it occurred during experiment, had nothing to do with the production of emphysema of the neck, and in two experiments was not associated with this emphysema, which thus exactly imitated that occurring during labor. (4) The healthy bronchi and trachea are able to resist the greatest possible expiratory effort.

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## ON DIGITAL EXAMINATION OF THE NASAL CHAMBERS AND DENUDATION OF THE TURBINATED BONES IN THE TREATMENT OF CHRONIC NASAL CATARRH.

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IN the varieties of chronic catarrh in which the discharge is purulent or composed of crusts, the mucous membrane covering the middle turbinated bones will be found to be thickened and softened. In the atrophic form of the disease, the inferior turbinated bone will participate in this condition, and the entire interior of the nose may be lined with membrane which is so far changed from the normal type as to be scarcely recognizable by any of the characters which anatomists employ in its description. I have been for some time in the habit of studying these altered structures as though they were periosteum and bone respectively, and of being guided in their treatment by principles similar to those which are relied upon in treating the diseases of the periosteum and adjacent tissues. In a word, the nasal mucoperiosteum can be divided or removed, the bone can be scraped or excised with freedom and often with advantage.

In order to determine with an approach to accuracy the condition of the interior of the nose, it is well in all cases of chronic catarrh to make a digital examination. It is proposed to conduct the examination in the following manner. The patient being placed under the influence of an anæsthetic, the index finger is inserted into the nostril and by gentle pressure the tip is directed upward and backward in order to



reach the plane of the level of the middle turbinated bone—a manipulation which is accomplished without difficulty. If the membrane covering the bone is in a healthy condition, the sensation to the finger is the same as though a firm yet resilient surface had been touched. If the parts are chronically inflamed, the membrane is much softer than in health, and is at once detached from the bone at the point of contact. By pushing the finger along the course of the bone the membrane is removed with ease. Should the bone be wedged against the septum, it can be forced out into a more favorable position; should it be found lying too far outward along the lateral wall of the chamber, it can be brought nearer the median line. The examination cannot always be completed without displacing the perpendicular plate of the ethmoid bone. The plate in many patients is not so thick as the vomer, and its ability to resist the pushing force of the finger is correspondingly diminished. The act of displacement is accompanied by a cracking sound, and the moderate resistance to the entrance of the finger to the plane of the sides of the middle turbinated bone is at once removed.

By the ordinary method of inspection the width of the middle turbinated bones cannot always be defined, but by the aid of the digital examination here proposed the relative width can be easily made out. As a rule, the wider bone lies on the side toward which the perpendicular plate of the ethmoid bone is deflected. The disposition for one of the two bones to be of unusual size, occurs at my hands so frequently as to suggest the probability that an exceptionally large lateral mass of the ethmoid bone may act as a predisposing cause to chronic inflammation. It would appear that the large surface is placed at a disadvantage in flushing off excess of secretion; the parts remain for long times together unventilated, and the temperature of the region maintained at a point too high to be consistent with health. Occasionally the entire region of the lateral mass and the adjacent septum are matted together by the products of inflammation, which evidently have been the result of prolonged sequestration. The anterior free end of the bone should next receive attention. This portion is often found wedged tightly between the median and the lateral walls of the nose, and can be examined with difficulty. It may be necessary to employ a bone-scoop or chisel to scrape away the membrane covering the part, and even to remove by breaking down the firm nodule of bone which frequently constitutes the tip.

Next in order the lower plane of the nose should be explored. This part of the examination is the least satisfactory by reason of the fact that the bones are at this plane more resistant and oppose the entrance of the finger to an extent which oftentimes prevents the operator making a complete digital search. Fortunately this region of the nose can be readily seen, and the difficulty, in truth, becomes a matter of minor

importance. If the septum is found deflected, it is now an appropriate time to remove the spur or to effect any procedure which experience has shown to be useful. The mucous membrane adheres much more tenaciously to the inferior than to the middle turbinated bone, and is less easily detached.

The bleeding following the exploration is moderate in amount and is easily controlled. The simple examination, without accompanying employment of instruments, can be completed in a few moments. The amount of the anæsthetic required is no larger than is needed to extract a tooth or to incise a felon. In one instance only did any untoward event follow the introduction of the finger. An inflammatory swelling of the septum ensued which gave to the patient the sensations of a severe attack of coryza. The condition slowly yielded to repeated scarifications and rest.

In those cases in which the discharge is purulent and offensive, portions of bone are found exposed and the mucous membrane lying in tags over extensively diseased surfaces. In such subjects the membranes are thicker than in health or in the chronic non-suppurative form of disease. The condition is confined to one side of the head.

The results of the manipulation have been most encouraging. The denuded surfaces become covered with a normal membrane, the discharge is lessened in quantity and is less tenacious in character. Cases of the most pronounced type of fetid catarrh have so far improved after a single digital examination and denudation of the middle turbinated bones as to be further advanced than would have been the case if the manipulation had been omitted and a long course of local applications substituted.

The treatment of each case after the denudation, is to be conducted on the same principles as have been generally accepted, and these need not be detailed in this place. The use of the electrocautery, the application of strong solutions of nitrate of silver, have now the happiest effect. Should the new membrane become tense and brawny, it may be occasionally deeply incised or small portions of the surface scraped by a bone-spoon or a chisel.

It is submitted that the manipulation is an aid to the diagnosis of nasal affections, and that the act of denudation is a safe and useful procedure.

NOTES TOWARD THE FORMATION OF CLINICAL GROUPS  
OF TUMORS.BY JONATHAN HUTCHINSON, F.R.S.,  
EMERITUS PROFESSOR OF SURGERY TO THE LONDON HOSPITAL.

(Continued from page 161.)

## MELANOTIC WHITLOWS.

AMONGST the several peculiar clinical forms which melanotic sarcoma presents, under the influence of what may be called the law of modification by locality, we have the melanotic whitlow. The resemblance of this disease to a chronic whitlow is so close, and the quantity of melanotic growth so small in the early stages, that it is almost always treated at first as being simply a disease of the nail. It needs sometimes the eye of faith to recognize the narrow band of black which borders the inflamed part. It would seem that the power to produce a pigmented structure is but feeble in the neighborhood of the nails; whenever there is much growth a non-pigmented mass is produced. Only at the edges of this is to be found the black edge which marks the original type. This mixture of colored and uncolored growth in melanotic sarcoma is, of course, common in all parts, but in none is it, I think, so marked as in the proximity of the nails.

A drawing which has been recently added to the collection of the Museum of the Royal College of Surgeons well exemplifies this. It is from the thumb of a middle-aged man, in whom the growth had been slowly developing for several years. The condition presented is that of a knob as large as a walnut at the end of the digit. All trace of the nail is lost, excepting at one or two parts. The growth is ulcerated over its whole surface, but shows no tendency to slough or become fetid. Just under its overhanging border there is in the unswollen skin a narrow margin of coal-black structure, which is conclusive as to its nature. This was demonstrable with great certainty in the patient, but is scarcely so in the drawing.

About twelve years ago I saw, through the kindness of Sir James Paget, the thumb of a gentleman, well known in the racing world, which presented this condition in a very early stage. The nail was simply thickened and fibrous, and the disease had by some been supposed to be only a chronic onychitis. At the edge of the nail on one side, however, was a definite black edge, not in the least raised, and looking very much as if the part had been touched with lunar caustic. Sir James amputated the thumb, and he told me afterward that an assistant at the operation avowed incredulity as to there being any melanosis, or any good reason for the operation. Eight or ten years later the diagnosis

was confirmed by a return of the disease under the scar, and I amputated again at the carpo-metacarpal joint. A year later, I had to remove melanotic glands from the armpit.

Two cases, of which I have given portraits in my illustrations of *Clinical Surgery*, show the state produced when the disease is allowed to advance. In one, from the great toe of an elderly woman, we see a large open ulcer involving the whole nail-bed and much enlarging its area. On this surface most of the structure is pale, but there are a few ill-margined masses in it which show pigment. In this case the patient, some months after recovering from amputation of her toe, had enlarged glands in her groin, and, after removal of these, others within the brim of the pelvis, which led to her death. In this instance, as in so many others, a mistake in the diagnosis led to a long delay in operative treatment, and was the cause of its non-success.

Another portrait, which forms part of the same plate, shows the melanotic growth creeping in the skin to some little distance from the nails. It shows no tendency to ulcerate, and but very little to growth, the layer of black being still very thin, indeed. In this the blackness had been mistaken by a superficial observer for that caused by caustic.

I might produce several other examples of the melanosis-whitlow, but enough have been given to illustrate the peculiarities of the disease when occurring in this position. It spreads slowly, destroys the nail, and the fungating growth which it finally produces fails altogether to obtain pigment and is quite colorless. The disease is slower in its stages than is the case with melanosis in most other positions. So far as I know, the growth presents no histological peculiarities; although its stages are slow, it tends eventually to affect the lymphatic glands and other parts with great certainty, and thus brings about the patient's death. Yet there is much greater hope of delaying the progress of the disease by operation than exists in most other forms of melanosis. I am not sure, however, whether this last remark will hold good as regards melanosis of the choroid, for we sometimes find, after removal of the eye for this disease at an early stage, that the patient secures a long period of immunity.

#### A NEW FORM OF EPITHELIAL CANCER OF THE FACE (THE CRATERIFORM ULCER).

I have already adduced the facts as to the peculiarities of the form of epithelial cancer known as "rodent ulcer," as illustrating the influence of local origin. It is a matter of common knowledge that well-characterized "rodent ulcers" are rarely seen, excepting on the face, and mostly near the eyelids, and that upon these regions the other varieties of epithelial cancer are scarcely ever met with. I have now, however, to introduce a competitor upon this special territory. There is a form



of malignant growth of epithelial type, but of remarkable peculiarities, that produces an ulcer which, provisionally, I have been accustomed to speak of as the crateriform ulcer. It is met with, so far as my experience goes, only on the upper part of the face, and more especially prefers the precise localities of the common rodent ulcer. It is rare, and I have seen only six or seven examples of it. All of them, allowing for differences of stage, were exactly alike.

The first stage is a bossy, rounded lump, which rapidly attains considerable size, and presents a somewhat conical summit. At this summit ulceration takes place, and, with exceedingly little of suppuration or obviously destructive inflammation, a deep cavity forms. It is at this stage that the term crater-like is applicable. The walls of the crater are of much thickness and of great firmness. The growth is much less vascular and less succulent than that of rodent, and, whilst it is easy to scrape the latter away, it is quite impossible to do so with this. I attempted it in one instance, and, though I used large and sharp instruments, the procedure was very unsatisfactory. The patients in whom these very peculiar ulcers form are like the subjects of rodent in all respects. It begins usually in those past middle age, and without any obvious cause. It is rapid in its progress, and grows as large in a few months as rodent would in as many years. It shows, so far as I have observed, no tendency to fungate or become warty, and in this respect, as well as in its hardness of structure, density, and thickness, it differs from what we observe in common epithelial cancer of other parts.

I am very sorry that I am not by any means as yet in a position to give the complete clinical history of this singular variety of local disease. I have not watched any single case to its end, and I do not know whether it usually causes the lymphatic glands to enlarge. All the cases which I have seen were subjected to early operation, and it would seem that excision is very successful, and relapses exceptional. In one case in which I excised the right upper eyelid of an elderly woman on account of a growth of this type, no recurrence ever took place on this side. Two years later a precisely similar growth developed itself on the other eyelid with exact symmetry. This second rapidly grew to a large size. It was in this instance that I attempted to scrape the growth away and failed. I believe, but am not quite sure, that enlargement of glands subsequently took place in this instance. Of four other examples of this disease—three under my own care and one under that of Mr. James Adams—I may briefly say that they all fitted exactly with the description I have given, were all seated on the upper part of the cheek, and were, one and all, excised within about six months from their beginning. So far as I know, no recurrence took place in any. Most of them were examined with the microscope, and the report always was that elements

characteristic of epithelial cancer were present. In my next case I shall be able to give a detailed account of the histological conditions.

A man, aged forty, was sent to me from Ipswich, with a very peculiar growth involving the right ala and side of his nose. There was great thickening, but very slight ulceration. The growth was ill-defined and involved both mucous membrane and skin. Sir James Paget was kind enough, at my request, to see the patient, and give me the great advantage of his opinion. It was that we had to do with an example of acute epithelial cancer, which ought to be excised immediately. It had been growing only a few months, and had distinctly begun, not with ulceration or warty growth, nor by any surface change, but by thickening of the substance of the ala. Only quite recently had any tendency to ulceration been observed. The ulcer just beginning was tending, as usual, to produce the crater form, but it had not advanced deeply.

I excised the whole of the ala and side of nose in its entire thickness. I did the operation with much misgiving, for the growth was so ill-defined that it seemed very likely that parts already more or less infiltrated might be left. I cut, however, very freely, and left the whole of that nostril open. No attempt was made to close the wound; the healing progressed well, and in due time the man was fitted with a shield to conceal the gap.

It is now three years since the operation, and I believe that he has never had any signs of recurrence.

This case is of especial value on account of the long-proved immunity from return, longer than is usual in rodent or the more common form of epithelial cancer, and certainly far longer than the conditions in this particular case justified us in expecting. Observing this result in most of the cases operated upon, I am induced to believe that this special form of growth is less malignant than either of them as regards local recurrence, and less so than common epithelial cancer as to gland implication. The following valuable report as to microscopic appearances has been furnished to me by my friend, Dr. A. Sangster, than whom no one is better qualified to give an opinion on such facts.

"In sections cut vertically to the cutaneous surface and examined under a low magnifying power, the sebaceous glands were seen occupying a continuous layer. Although it is difficult to say what constitutes departure from the normal as regards the size of sebaceous glands in this situation, there was little doubt that they were, in this instance, hypertrophied. At one end of the section (that remote from the focus of disease) the epidermis (Malpighian layer) was normal in appearance, as were also the subjacent and surrounding tissues; soon, however, on approaching the opposite extremity of the section—the sebaceous gland formation began to betray great irregularity; the mouths of the hair follicles gaping. Still the Malpighian layer, where it could be traced, was normal in such prolongations as there were, appearing rather in association with gland formation, than as finger-like interpapillary processes. Associated with this irregular gland-formation there was abundant cell-infiltration of the subjacent tissues and tracts, and rounded masses of epidermic cells (showing distinct capsular lamination under a

high power) were seen in this situation, in great abundance, surrounded by the small round-cell infiltrated tissue.

"At that portion of the section most remote from the normal structures, the sebaceous glands attained the maximum of irregularity and degenerative change. Here they were rather recognizable as lacunar spaces with irregularly crenated outlines. Here and there, lying in the spaces, could be recognized the shrunken yellowish masses of degenerated sebaceous material.

"Lying in close proximity, there were isolated rounded masses of epithelial cells having a central area occupied by a yellowish material, identical in appearance with that seen in the lacunar spaces above alluded to; these might pass as epithelial nests.

"I am of the opinion that the material is from a case of epithelioma, probably originating in the sebaceous glands."

I think I may claim to have now proved my point, that we have in the crateriform ulcer a variety of epithelial cancer, of which the clinical features—its aspect and history—are more valuable for diagnosis than its microscopic peculiarities. It differs widely from rodent ulcer, and as much so from the common type of epithelial cancer, and it presents naked-eye features which may be recognized at a glance.

#### RECURRING FIBROID OF THE SKIN (SPINDLE-CELLED SARCOMA).

I may confess that it has not been without regret that I have witnessed the submerging of Paget's clinical group of "recurring fibroids" in the large histological family of spindle-celled sarcomata. It might possibly have been more convenient in practice to have pushed the clinical grouping into more detail, and whilst recognizing the family relationship, to have tried to ascertain by the careful collation of parallel cases, whether the life history of these growths does not differ considerably in connection with the precise tissue and region in which they originate. My attention has been strongly drawn to the remarkable sameness of appearance and of tendencies of these growths when they originate in the skin or close under it. Examples of the cutaneous fibroid recurrent are very rare, but they are very peculiar in the mode of development and the inveteracy and rapidity with which they recur on extirpation. The fallacy which is always present when a deeply placed fibroid tumor returns after excision, namely, that it may possibly not have been completely excised, scarcely exists in those of which I am now about to speak. It is usually easy to make sure that the whole of a growth springing from the skin has been removed. Yet no cases could possibly illustrate more strongly the tendency to local recurrence than did those which I am now about to relate. Most surgeons of extended experience will, I expect, be able to recall to memory two or three (and probably not more) and will bear me out in the statement that they are all almost exactly alike.



The case which first interested me in this subject was that of a girl named Holland, whom I saw in Guy's Hospital, under Mr. Cock's care, in 1853. The growth had begun after a slight injury at the age of thirteen, under the skin of the left thigh. Mr. Cock excised it freely six times during seven years.<sup>1</sup> Finally, I believe, the limb was amputated, with the result that although the stump healed well, a recurrent growth developed itself just where the tourniquet pressed. My memory does not recall a single case at all closely parallel to this during the twenty-five years of my official connection with the London Hospital, either in my own practice or in that of my colleagues. In private practice I have seen three. In only two of these were operations performed, and, respecting the third, I can only assert that its external features were precisely the same as those of the others. In two out of the three the growth was, as in Mr. Cock's case, on the thigh, in the third on the lower part of the abdomen. I have never seen the recurring fibroid of skin on the upper extremities, on the head, nor, with one doubtful exception, on the upper part of the trunk.

In the case just referred to as occurring on the abdomen, the patient was a woman of forty-six. The growth occurred as a number of rounded lumps confluent at their bases and covering an area of skin just below the umbilicus as large as two outspread hands. These had been extending with intervals after three operations, for sixteen years. During the last eleven the disease had not been interfered with. I possess a good colored portrait of the condition, which is exactly like that presented in one of the two following cases. The area involved was so large that I could not advise any further operation, nor, as will be seen, had my experience of other cases been such as to make me hopeful.

About fifteen years ago I saw at the request of Mr. Robert Cook, of Stoke Newington, a gentleman of about forty-five, named Hamilton. He had a growth on the front of the left thigh, a little above the knee, which involved the skin. It had begun, he said, in the site of a laceration from the horn of a bullock. The lesion consisted in a group of soft lumps, some of them solid, others containing blood. I excised the whole very freely and during the next four years six similar operations were performed. On one occasion, during my absence from town, the recurrent growth was excised by Sir James Paget, and I mention this as an additional guarantee that the operations were liberal. The very large wounds which were made always healed by granulation with remarkable rapidity, and in the end the whole front of the thigh had been skinned. The disease always returned, either in the middle of the scar or under the healthy skin under one part of the edge, and it always was at first in the form of a little tubercle, which rapidly became converted into a blood cyst. If let alone, the tendency was to fungate and to bleed. None of the growths ever became in the least warty. I used the actual cautery on several occasions and once at least destroyed the growth with chloride of zinc. Mr. H. at length became, not unnaturally, disappointed at the want of permanent success from legitimate surgery,

<sup>1</sup> See Medical Times and Gazette, vol. ii., 1853.



and placed himself in the hands of a charlatan. After this I did not see him again until he was dying. He was then very cachectic, being exhausted from hemorrhages and had a large tumor in his abdomen. I succeeded in obtaining a post-mortem, the chief result of which was to show that the abdominal tumor was in connection with the liver, and consisted of a cyst, the walls of which were nowhere more than a quarter of an inch in thickness and which contained blood. This cyst was as large as a child's head. I believe, but I cannot remember for certain, that there was a history of malignant disease in the family. The whole duration of his disease from first to last must have been more than five years. He never had any gland enlargements.

The subject of my third case was a gentleman in physical appearance almost the counterpart of Mr. Hamilton. He was a spare, gray man, looking older than his years. I first saw Mr. Knight at the request of Mr. James Adams, and in consultation with him, but it may be well to date my narrative from the time when, in consequence of Mr. Adams's illness, Mr. K. passed under my own care; this was in February, 1884. It was then five and a half years from the beginning of the disease; and three operations had been performed, with prompt recurrence after each. Mr. Knight's statement was as follows: "I was staying at the sea-side and used to bathe, and toward the end of the time noticed that the salt water always smarted on the back of my thigh. I got my wife to look at it, and she said that there was a tiny red spot there. A few weeks later there were three little red spots; and after this they rapidly grew together. I consulted a surgeon, who advised me not to meddle with it, but two years from the beginning I went to Sir James Paget, who said that it must be excised without a day's unnecessary delay. Having got this opinion, I placed myself under Mr. James Adams (August, 1880), and got the operation done; seven months later it was necessary to excise the scar again; nine months after this it was excised again."

It was some months after the second operation that I first met Mr. Adams, in consultation, on account of a third recurrence. The former operations had been very free, and the back of the thigh from the popliteal space half way up was occupied by scar. At the edges of this scar in several places were a few little nodules of recurred growth. They were painful, but so small that unless the patient had himself pointed them out they might have been easily overlooked. We advised another operation; and this was done by Mr. Adams. After this I did not see Mr. Knight for two years. When he came to see me in 1884 he had still no gland disease, and the recurrence was strictly local. It consisted chiefly in the development of a mass from the middle of the scar, an inch and half in height, and in shape not unlike a pigeon's egg set on end, and this had ulcerated at several spots, and was just beginning to cause pain and to bleed. I wrapped it up in chloride of zinc, and in a week it sloughed off, leaving a deep wound. In the course of another week there had sprouted up from the bottom of this wound a fibroid fungous mass a quarter of an inch in height.

After this I again used chloride of zinc, and lastly in December, 1884, I excised an enormous elliptical portion of skin, including the scar of the former operations, and extending an inch at least beyond all suspicious portions. This operation laid bare the hamstring muscles and peroneal nerve. The wound granulated well, but was long in healing. No sooner had it healed than a soft mass formed under the scar.

Mr. K. declined further interference, and sank from exhaustion in August, 1885, seven years from the beginning.

It will be seen that these cases resemble each other in the remarkable persistency with which local recurrence took place, and in the absence throughout of any tendency to gland disease. In each, the early stage of the new growth was insidious, and for some time very slow ; but, if left alone, there was ultimately a tendency to fungate and to the formation of blood-cysts. The deep fascia became involved if the growth were neglected, but in the first instance the skin alone was implicated. It will easily be understood that the operations were done with the utmost freedom ; they were by three different operators, and most of them were done after we had full warning as to the tendency to recur. I can speak for my own, and I have not the least doubt that those done by my friends were at least as free. I took the skin away more than once, an inch or an inch and a half wide of the new growth : yet on no occasion did we obtain more than six months' immunity. The tumors were, I think, softer in structure, and grew more rapidly with each recurrence. Their elements were repeatedly, and by different microscopists, assigned to the spindle-celled sarcomata.

Any one who takes the trouble to compare the three cases which I have adduced, may possibly be inclined to doubt whether treatment by operation offers any advantages to the patient. In the case in which operative treatment was abandoned eleven years ago, the patient is alive, and although the disease is extensive she does not suffer much from it. The subjects of the two others both died at the end of about seven years, having undergone repeated operations, involving expense, much confinement to the house, and some pain. Perhaps, however, these facts do not afford us a fair picture, and we must collect others before we venture to formulate rules of practice. Mr. Birkett has mentioned to me a case in which a middle-aged gentleman, who had undergone several operations with the result of rapid recurrence, was finally cured by a free application of chloride of zinc. I may record, also, a case which was some years ago under my own care, in which I excised from the pectoral region of a young girl a fungating tumor of similar nature. In this instance the patient is now, some six years later, without recurrence. At the time of the operation there was said to be no family history ; but since then the patient's mother has died of cancer of the breast. Perhaps I am now falling into the error of leaving the clinical guides for classification, and adopting the histological ones. In this instance, although the growth contained spindle-shaped cells, and grew like a fungus from the skin, it did not show the blood-cysts nor the multiple nodosities which were present in the three cases which I have narrated. It is possible, therefore, that its non-recurrence is to be explained by the circumstance that it was not really of the same nature as the others.

If we admit the clinical convenience of placing the fibroid recurrences of the skin in a group by themselves, we shall have to constitute another group of these tumors of similar structure, but much more fibrous, which develop in deeper parts. These are much harder. They are often found attached to the periosteum of bones or to deep fascia. Most of the cases adduced by Paget, in his *Lectures* (page 600, 3d edition), are of this class. We should also have to describe another group, in which hard fibrous tumors developed deeply, were of very slow growth, and tended to unsymmetrical multiplicity. Of these, I have described some remarkable examples in a recent number of the *Annals of Surgery*.

NOTE.—Of nearly all the cases which I have mentioned in this paper, I possess good colored drawings, which help very materially toward the realization of their features of similarity. These I shall, at any time, have great pleasure in showing to any one interested in them.

(To be concluded.)

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## CERTAIN CASES OF PERIODIC DISEASE OF THE CONJUNCTIVA ALLIED TO HAY FEVER.

BY H. GRADLE, M.D.,

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THERE have come under my notice four cases of a periodic affection of the conjunctiva of the eye, which did not correspond to any of the types of disease described in ophthalmic literature. They were all as rebellious to treatment as they seemed puzzling in their nature. At last their periodicity—lasting only, as they did, during the warm season—made it appear probable to me that they represented the pathological entity known as hay fever, localized, however, entirely or principally in the conjunctiva.

It is true we know neither the pathogenesis nor the real origin of hay fever, but we use this term in a very definite way to characterize certain irritative symptoms which return in certain susceptible individuals during some of the warm months of every year.

This irritation pertains to the respiratory tract in regular hay fever, but very frequently involves likewise the conjunctiva. We further know that this irritation is either favored or retarded by the locality in which the individual spends the summer months. This climatic test gave a similar positive result in two of my patients who availed themselves of it.

The lesions which were developed during the latter course of the disease in the palpebral conjunctiva of two (or perhaps three) of my patients,

resembled, so far as the unaided eye could decide, the hypertrophy of the ocular conjunctiva occurring in that rare disease known as "spring catarrh" (Fruehjahrs-catarrh of Saemisch). The only description of this disease in the English literature with which I am acquainted, is that of Burnett (*Archives of Ophthalmology*, vol. x. p. 414), under the name "circumcorneal hypertrophy of the conjunctiva."

In this spring catarrh the conjunctiva forms prominences around the cornea in the shape of pale, grayish, firm tumors of a gelatinous appearance, sometimes coalescing into an incomplete circumcorneal ring. This disease, too, returns annually in the spring or early summer, and keeps the eye in a state of irritability until fall, when all symptoms cease, and even the conjunctival lesions disappear, or at least subside.

Spring catarrh has proved about as intractable to treatment as the disease I am now describing. Moreover, Reymond, Vetsch, and Burnett have described lesions of the conjunctiva of the lids accompanying spring catarrh, in some instances, not unlike those I have seen in my cases. Since in all four of my cases the conjunctiva of the eyeball was not involved, they were certainly not instances of spring catarrh. Yet the periodicity of these two diseases, and the resemblance in their lesions, could not but deserve special mention.

The four patients to whom I refer began complaining between May and July each year, and continued to suffer until cold weather set in. Two of them learned that a prolonged sojourn in other parts of the country stopped their annoyance, and this annual cure was not interfered with by a return to Chicago before the end of the warm weather. Three of these patients have never had any other hay fever symptoms; one of them has gradually developed some irritation of other parts of the respiratory tract not sufficiently characteristic to be called hay fever, were it not for its periodicity.

The symptoms were continuous slight discomfort in the form of burning, itching, or fulness of the eyes, increasing decidedly on using the eyes for work, so as to cut short any attempts at prolonged reading or writing. One boy, in whom this continuous irritation, as well as the asthenopia on using the eyes, was slight, had attacks of sharp pain in the eye almost every afternoon, lasting a couple of hours, and terminating abruptly with the removal of strings of tenacious mucus from the conjunctival sac. One patient had none, or but the most insignificant conjunctival secretion; the others had stringy mucus, or thick pus, forming on the surface of the conjunctiva. In one instance the conjunctiva appeared nearly normal, although slightly hyperæmic. In two cases the conjunctiva appeared to be in a state of moderate chronic catarrhal inflammation. In one of these, however, the condition changed during the third year, resembling now the somewhat velvety surface of a follicular (not granular) conjunctivitis, to become



normal again during the following winter. During the fourth attack of this patient the peculiar lesions above referred to were found nearly as well developed as in the conjunctiva of another individual whom I saw during his twentieth attack. While the conjunctiva of the lower lid was simply congested and somewhat relaxed and succulent, so to speak, the conjunctiva of the upper lid was not smooth, but studded with granules—or one might almost say papules—about the size of a pin's head, or a little larger; flattened, not absolutely opaque, although hardly translucent, and of a yellowish-gray color.

The membrane was but moderately injected. The appearance was unlike that of either papillary trachoma, or of the sago granules of that disease. It reminded me somewhat of amylaceous degeneration. During the present cold weather these conjunctival membranes are again normal in appearance. The view which I at first entertained, that some of these patients had simply chronic catarrhal conjunctivitis, was soon disproved by the inefficiency of the treatment. The annual return of the trouble has besides disposed of that view.

The following is the essential history of the cases :

CASE I.—I. U., a boy of nine years of age, was seen on the 28th of May, 1880. He had been in fair health, but always presented an unhealthy yellowish complexion, without any evidence of icterus. There existed very slight choreiform movements of the neck and shoulders. His tongue was always furred; yet his appetite and digestion were said to be good. Since four years of age he had complained of his eyes every summer, until fall. Last year, about the end of July, a trip to the seashore restored his comfort. During the winter he had never complained of his eyes. About the middle of May his eyes began troubling him again. He had hardly any annoyance during the greater part of the day, and but little discomfort on reading; but about four o'clock a burning pain set in, causing him to close the eyes, and often making him cry. About two hours later he could rub out some "strings," and in a few minutes was again comfortable. These strings I examined microscopically, a few days later, and found them to consist of mucus, some epithelial cells, and very few leucocytes, besides numerous fine granules, which I could not then identify as parasites. During the attack his eyes were said to be reddened.

The conjunctiva I found to be slightly congested in the lower lids, and more so in the upper lids. On the right upper lid the surface was somewhat velvety, as in chronic follicular catarrh. This was the appearance during the free interval. I was never able to see the boy during an attack of pain, although I called at the house repeatedly in the afternoon; for the attacks did not occur every day, especially after the treatment was begun. (My present recollection is that they were more likely to come on during hot weather.) I ordered the use of a concentrated solution of boracic acid to be dropped into the conjunctival sac a few times daily, and especially during the attacks. The nose was said to be somewhat "stuffy," although the child did not complain of it. There certainly were no spells of sneezing or other hay fever symptoms, though some chronic pharyngitis existed. Suspecting vaguely a nasal origin of

the disease, I ordered a nasal douche in the evening and before the expected attack.

The boy claimed during the next few days that the nasal douche relieved him, although his nose hardly seemed to trouble him. At any rate, the attacks were less frequent and perhaps less severe. The conjunctival membrane appeared less congested during the next few weeks.

I was called again on the 10th of July. After comparative comfort, during the month of June, the trouble returned in July, more severely than before. The conjunctiva was more congested and more velvety, and in the fornix there appeared sago-like granules, with a central point of injection. My notes do not describe the condition fully, but I remember that the appearance was new to me, and different from the granules of trachoma. I treated him for several days with a weak solution of nitrate of silver, and had him insert iodoform bougies in the nares. The improvement which I obtained during the next few days did not last, however. The following week I gave him daily ten grains of quinine, in three divided doses, again with some temporary benefit. I did not see him again, but learned from the parents that no permanent relief was obtained. They took him to the seashore, in August, with immediate satisfactory result.

The child was seen in August, 1884, by Dr. E. J. Kuh, to whom I am indebted for the following notes: The eye trouble had returned every year during the months of May to September. Dr. Kuh did not examine the conjunctiva accurately, merely noting its congestion, since he was consulted for other reasons. The chorea still existed; there were also occasional polyuria and incontinence of urine, and he noticed a systolic fremitus on listening to the heart. The child had frequent "colds," accompanied by cough and sneezing fits. The vascular plexus over the inferior turbinated bones was enlarged at times on both sides. Touching this region with a probe produced considerable irritation of the conjunctiva. Dr. Kuh considered the case as one of reflex neurosis, starting from the vascular swelling in the nose, and proposed destroying the vessels by the galvanocautery. This operation the parents refused. Dr. Kuh was inclined to consider the trouble as hay fever, but the case was not typical enough to make the diagnosis certain.

CASE II.—Dr. M. M., a prominent physician, of middle age, began complaining of his eyes in the summer of 1882. His health was, and has since been, good. For many years he has had a myopia of 6 D., corrected by glasses, which has never annoyed him in any manner. At that time the conjunctiva showed the usual condition of slight chronic catarrh. The secretion was always moderate. He complained of slight burning in the eyes, usually made worse by reading. Boracic acid collyrium allayed his annoyance for a while, but not permanently. On ordering a solution of sulphate of zinc, I found his conjunctiva very sensitive to a one-half per cent. solution, and had to reduce its strength to one grain per ounce, but without permanent benefit. A careful ophthalmoscopic and dioptric examination showed no other cause for his discomfort. He attributed the irritation to dust, but I never found him quite free from it, even on rainy days. The trouble ceased gradually during the fall.

In 1883 it returned again, about the end of May. On changing his open buggy for a closed coupé, in order to protect himself against dust, he thought he had eliminated the cause, but only for a short time. The

irritation was more severe than during the previous year, and sometimes made it difficult for him to keep his eyes open. Reading was often, but not always, interfered with, but when kept up in the evening it did not make the eyes more irritable than they had been. Nothing was found objectively but a slight catarrhal condition of the conjunctiva. There was no evidence of obstruction of the lachrymal duct. Collyria of acetate of lead and applications of nitrate of silver, one to two grains per ounce, proved useless. The eye was again intolerant to any strong application. Acting on the suggestion of Noyes, who had used very weak washes of nitrate of silver in a peculiar persistent form of conjunctivitis, seen by him often in New York City, and attributed by him to the influence of dust, I directed the patient to drop in a solution of nitrate of silver, one-eighth grain per ounce. This gave him more satisfaction than any previous treatment, but did not cure him. On going to Lake Minnetonka, in August, he found immediate and permanent relief.

In 1884 the same history repeated itself. The conjunctiva now showed enlarged follicles in the fornix, resembling the condition of follicular catarrh. Dr. M. again went to Lake Minnetonka, at the end of July, with the most satisfactory result to his eyes. Returning in September, he noticed very little irritation during that month in this city. During the winter I examined the eyes repeatedly, and found the conjunctiva perfectly normal, with the exception of a trifling passive hyperæmia.

The summer of 1885 was, if anything, more disagreeable to Dr. M. than previous years: there was more secretion. Examining him in June, I noticed flat elevations on the conjunctiva over the tarsus of both upper lids; the membrane was intensely reddened, while the elevations were paler and more yellowish, and shaded off gradually into the surrounding mucous membrane; their diameter was about one millimetre; the mucus adhered to the conjunctiva in the form of strings. Weak nitrate of silver solutions gave some relief, but had no great influence. The sulphate of copper stick was better tolerated than I expected, but accomplished no more than did the silver solutions. Cocaine, in one and two per cent. solution, relieved for some hours, but neither so completely, nor for a sufficient length of time, to induce Dr. M. to use it except during the days of most intense discomfort. I examined the nose thoroughly, but found no more swelling of the vascular plexus or redness of the mucous membrane than most persons present in this climate; there were absolutely no nasal symptoms. Irritation of the turbinated bone with a probe produced, however, decided discomfort in the eyes. But, on the other hand, the thorough use of cocaine in the nose did not relieve the cutaneous irritation of the eye. Dr. M. started early in July on a trip to New Mexico and Colorado, and returned in August. Since leaving the city he has had no further trouble, nor did this return later, perhaps on account of the cool summer. His conjunctiva is now perfectly normal, and the elevations have disappeared completely.

CASE III.—Mr. D. W., æt. thirty-two years has had sore eyes every summer since his twelfth year. The attacks begin about July and end toward September. Their severity varied considerably in different years, being mitigated by cooler weather. He had been treated by oculists during previous years without much benefit. He complained of steady burning and inability to use the eyes for any length of



time, with occasional severe pain during the day, but not at any regular time. There had been all summer a copious purulent discharge from the eyes. I saw him on the 15th of August, 1885. The lids were very little thickened, and at a distance the eyes seemed almost normal. On everting the lids the conjunctiva was found reddened and uniformly thickened. The surface was smooth on the lower lid, but on the upper lids there existed flat prominences, one to two millimetres large, not distinct from the rest of the mucous membrane—that is to say, not strictly circumscribed, but diffuse in outline. They were paler and more yellowish than the rest of the surface, which was markedly injected. They did not extend into the fornix, but spread all over the tarsal portion. The surface was covered with tenacious pus. There was no subjective complaint or objective anomaly of the nose. There was a manifest hypermetropia of 0.75 D. in the right eye and 4 D. in the left eye; which the gentleman assured me had never troubled him during the winter.

Nitrate of silver solution, in the strength of one-fifth per cent., considerably relieved the burning, but did not alter the condition of the conjunctiva. The spells of pain became less frequent during the following week, but hardly less severe. The instillation of castor oil at night was of no particular service. Cocaine solutions relieved his pain, but proved only palliative. One week's interruption of the treatment at the end of August allowed the trouble to return to nearly its former severity. As I could not promise him any cure during the present summer, he ceased further treatment. Since the cold weather has set in he has been free from all ocular annoyance. I have not had an opportunity to examine his eyes since that time.

CASE IV.—Mr. H. B., of Dakota, æt. thirty-four years, had normal eyes and good health until the summer of 1884. During the winter following he was again free from complaint, but with the beginning of warm weather in 1885 the same condition returned. He has slight burning and discomfort in the eyes continuously, but hardly sufficient to annoy him. On reading, this irritation increases, however, so as to force him to stop within a few minutes. At such times the eyes water freely. There is, also, a steady frontal headache, not severe enough to keep his attention directed to it continuously.

When seen August 26, 1885, the lids and surrounding skin appeared somewhat puffy, and of a brownish discoloration, such as is met with occasionally in acute catarrh or hay fever. There was no indication of obstruction of the nasal duct. The conjunctiva was almost normal, a very slight redness and minimal mucous secretion indicating the least possible degree of catarrhal change. Vision, refraction, and accommodation were normal. He admitted having some nasal catarrh, but inspection showed only moderate swelling of the nasal mucous membrane and slight secretion. The probe touching the nasal membrane produced moderate conjunctival irritation and slight secretion. There was no watery discharge from the nose. His frontal headache made me suspect a catarrh of the frontal sinus. But I could get no evidence of it. Percussion of the forehead and temples was not painful. The nasal douche was used for a few days on the strength of this suspicion, but afforded no relief to the eyes. Nitrate of silver solution applied to the conjunctiva for a week was of no more benefit than the treatment of the nose by means of cocaine spray and insufflation of dilute nitrate of silver



powder. In mentioning the negative effect of these remedies, I do so bearing in mind numerous cases of catarrhal trouble of the conjunctiva, lachrymal duct, and nasal passages, in which similar treatment proved effectually curative. The patient remained in the city ten days without any improvement beyond a lessening of the puffy condition of the lids. Since I suspected the ocular symptoms and the headache to be a so-called "reflex" disturbance of nasal origin, I suggested to him the galvanocaustic treatment of the nose as a harmless, and possibly useful operation. He preferred to defer this for personal reasons. I advised him, on his departure, to take iodide of potassium internally, and to paint tincture of iodine over the brows on account of its effect on the nose, of which I had previously seen conclusive instances. I have not heard again from him.

In all these instances I have referred mainly to the positive symptoms. In no case did I omit a careful and full examination of the eyes and minute inquiry into the general health as to any other cause of these summer attacks, but only with negative result. I can, therefore, give no further information as to the nature of this hitherto undescribed disease.

CENTRAL MUSIC HALL, CHICAGO.

## A STUDY OF DIAPHRAGMATIC PLEURISY.

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A CASE of diaphragmatic pleurisy which came under the writer's observation, some months since, attracted his attention to this very rare disease, and forms the basis of this study.

Diaphragmatic pleurisy seems to have been known to the ancients in a general way. They describe it under many different names, as phrenitis, paraphrenitis, diaphragmitis, etc. Under these names they included several distinct affections, which had, however, the common symptoms, fever and delirium. Hippocrates<sup>1</sup> used the term phrenitis, but as designating a febrile state only, and not as indicating any disease of the diaphragm itself.

Oelguinetus and Tralian, however, seem to have known true phrenitis or inflammation of the diaphragm, for they speak of the distinct type of the respiratory movements in the latter affection—a type which they failed to notice in ordinary phrenitis, or delirium with fever.

The term paraphrenitis (first used by Rufus, of Ephesus,<sup>2</sup> a contemporary of Galen) had a more definite signification, and was applied by

<sup>1</sup> The Works of Hippocrates, by Francis Adams, Sydenham Society, 1849, vol. i. p. 418.

<sup>2</sup> Rufus, of Ephesus, *De Corpor. Human.*, lib. i.

him to actual or supposed inflammation of the diaphragm where the brain was affected symptomatically. This author states that the partition which divided the organs of the chest from those of the abdomen was called *διαφραγμα* or *θρενες* (the soul), the ancients supposing the seat of the soul to be in the diaphragm, and he goes on to say, that as the term phrenitis was used to describe several distinct affections, he proposes that inflammation of the diaphragm should be designated as paraphrenitis, simply to prevent confusion. Galen<sup>1</sup> also knew diaphragmitis as a distinct affection, and in a chapter entitled "Phrenitis from inflammation of the brain, and that from inflammation of the *diaphragm*," describes the delirium which follows inflammation of the brain, of the lungs, and of the pleura, and remarks that inflammation of no other organ causes such continued delirium as that of the diaphragm. This writer, however, placed the seat of the inflammation in the *muscular* structure of this partition, and not in its serous covering, though he none the less accurately described the peculiar character of the respiration, and the retraction of the hypochondriac region, always present in this malady.

Wolffius<sup>2</sup> (1661) also recognized this disease as a distinct affection, and gives its symptoms in more or less detail. Following the last writer, Boerhaave<sup>3</sup> gives a complete description of diaphragmatic pleurisy, under the name paraphrenitis, recognizing it as an inflammation of the serous covering, viz.: "Si morbus pleuritidi similis occupat eam membranæ pleuræ partem quæ diaphragma ambit, vel et ipsum septum medium; paraphrenitidem appellant."

Huxam<sup>4</sup> goes further, and describes both primitive and secondary inflammation of the diaphragm. Morgagni<sup>5</sup> gives the case of a man who having escaped inflammation of the lungs, was taken with "a pleuro-peripneumony, which was succeeded by a phrenitis, and even by a paraphrenitis," and explains at length the exact sense in which the latter term is used by him, and declares that he does not wish to be understood as saying that the delirium (phrenitis) in this case necessarily depended on inflammation of the diaphragm. Sepulchretus<sup>6</sup> gives two observations of inflammation of the diaphragm, one from Blasius<sup>7</sup> and the other from Laelius à Fronté. The latter saw the diaphragm actually suppurated, and the former greatly inflamed after a phrenitis. Finally, Schneider<sup>8</sup> wrote quite fully on inflammatory affections of the diaphragm. With this author our history of the subject is brought down to the

<sup>1</sup> De Locis affectis, lib. v. cap. v.

<sup>2</sup> De Septi Transversi Inflammatione; Argentorati, 1661.

<sup>3</sup> Aphor. de Cognos. et Curand. Morb., 1709.

<sup>4</sup> Essay of Fevers, 1747.

<sup>5</sup> De Sedibus et Causis Morborum. Translation of Dr. John Alexander, London, 1749, book I. letter vii. art. 14, p. 139.

<sup>6</sup> Anat. Practica ex Cadav. Morbo denati. Edited by Theo. Boulton, Geneva, 1679.

<sup>7</sup> Misc. Anatomica, etc., liber I. sec. i. obs. i., Amstelodami, 1673.

<sup>8</sup> De Inflamm. Diaphragmatis, Wittenberg, 1665.

eighteenth century. During this hundred years our practical knowledge of diaphragmatic pleurisy cannot be said to have increased, though an enormous amount was written on the subject. I find, after careful search, some twenty-two distinct treatises of more or less scientific value written between 1700 and 1800, but I shall allude only to the more important of these monographs. Selle<sup>1</sup> seems to have been the first to use the term *diaphragmitis*, and, moreover, he gives the signs and symptoms of the disease with unusual clearness. Stoll<sup>2</sup> gives not only the general symptoms of the disease, but two cases thereof, observed by himself, with the post-mortem appearances. Lieutaud,<sup>3</sup> writing in 1767, gives three cases of diaphragmatic pleurisy, taken from De Haen,<sup>4</sup> and Cullen<sup>5</sup> directs particular attention to the disease, as involving not the muscle, but the pleura which covers it.

It was not, however, until the early part of the present century, after Bichat's researches, that inflammation of the serous coverings in general, and the diaphragmatic pleura in particular, attracted general attention to the part played by the latter in the causation of the disease before us. Portal<sup>6</sup> wrote that inflammation of the diaphragmatic pleura was by no means so rare a disease as was formerly supposed. Pierre Frank,<sup>7</sup> though he gives a number of the characteristic symptoms of this affection, confounds it with pleurisy proper and peritonitis. Roy,<sup>8</sup> in describing the risus sardonicus, declares it to be a constant symptom of inflammation of the diaphragmatic pleura. Laennec,<sup>9</sup> in the first edition of his work, describes inflammation of the diaphragm under the general head of circumscribed pleurisies. He declares the former to be a very rare and grave disease, but gives no definite diagnostic signs. Buffinton,<sup>10</sup> again, gives the symptoms of this disease, and says the malady is always fatal. This brings us to Andral,<sup>11</sup> who was the first to publish definite observations under the name of diaphragmatic pleurisy, and to show that the affection might be primary or secondary. He gives five cases in his *Clinique Médicale*,<sup>12</sup> and divides the symptoms into four groups, viz., 1st, the pain, increased by pressure, along the cartilaginous border of the false ribs, and extending down and outward; 2d, the almost complete immobility of the diaphragm; 3d, the expression of the countenance; and, 4th, the constant orthopnœa, with forward inclination of the body. To Andral must be given the credit of giving this disease, with its signs and symptoms, a definite place in medical literature. A number of authors after Andral wrote on this subject with more or less fulness

<sup>1</sup> Rudimenta Pyretologie, p. 170.

<sup>3</sup> Historia Anat Medica, vol. i. p. 95.

<sup>5</sup> Elements of Practical Medicine, 1784

<sup>7</sup> De Cur. hominum Morbis Epitome, 1812, lib. ii. p. 179.

<sup>8</sup> Traité sur le rire, Paris, 1814.

<sup>10</sup> Paris Thesis, 1822.

<sup>12</sup> Clinique Médicale, Paris, 1824, vol. i. p. 480.

<sup>2</sup> Radio Medendi, 1777, p. 345.

<sup>4</sup> Radio Meden part I p. 84, and part IX. p. 17.

<sup>6</sup> Anatomie Médicale, 1803, vol. iv. p. 233.

<sup>9</sup> Traité de l'auscultation Médiante, Paris, 1819.

<sup>11</sup> Arch. de Médecine, October, 1823.

and accuracy, Joseph Frank<sup>1</sup> more particularly giving much space to it. He adopted, however, the idea and nomenclature of the ancients, in spite of his acquaintance with Andral's advanced treatise. Mehliß<sup>2</sup> also wrote at some length on inflammatory affections of the diaphragm, but it remained for Gueneau de Mussy,<sup>3</sup> in 1853, to write the first elaborate monograph on diaphragmatic pleurisy, and the great importance of this work will be seen further on in our paper. I find a number of other articles on the subject, published from 1853 to the present date, reference to which will be found in the text.

So much for the history of our subject, and before treating it more in detail, I give briefly my own case, which I wish to put on record :

The patient, a man of about forty-one years, was brought to our office, in the words of his physician, "for a diagnosis." He had been sick for nine weeks; his illness had begun with a chill, followed by intense pain referred to the lower intercostal region, more particularly on the right side over the liver, with great and increasing difficulty of respiration. He had been, almost from the first, unable to lie down, sitting always with the body bent forward, and his hands pressed to his side to prevent any extra motion. His cough was incessant and dry, his dyspnoea and anxiety of countenance, even at this time, painful to behold. Though I had never seen a case of diaphragmatic pleurisy, I was led to suggest that the trouble was with this structure even before making a careful examination, for I knew of nothing which could produce the peculiar distinctive respiration, found in this patient, except some trouble of the diaphragm.

On examination, the abdomen was found retracted, the diaphragm almost immobile, and the respiration entirely costal. There were points anteriorly and posteriorly painful to pressure. On percussion, some dulness was observed around the lower part of the chest, especially on the right side behind. On auscultation, pleural friction sounds were heard on the left side only; on the right, feeble respiratory murmur, with subcrepitant râles in a circumscribed space at the base of the lung, the inflammation having extended from the diaphragm to the lung and set up a localized pneumonia.

Such being the signs and symptoms in the case, a diagnosis of diaphragmatic pleurisy of tubercular origin, with slight effusion on the right side, was made by my father, Prof. Donaldson. It only remains to say that the patient grew gradually worse, the spot of pneumonia was not resolved, and his lung began to break down. Owing to the great pain that any movement of the diaphragm gave him, he was able to expectorate to a limited extent only, which increased his sufferings and hastened his death.

When we consider the structure and position of the diaphragm, the number of vessels and nerves which pass through it, the organs to which it is adjacent, and the three serous coverings with which it is con-

<sup>1</sup> Pathologie Médicale, vol. iv. p. 371.

<sup>2</sup> Anat. du Diaphragme, chez l'homme, 1845.

<sup>3</sup> Archives de Médecine, 1853-54.



nected, its pathological importance is apparent, and it is a matter of surprise that so little attention has been given it as the seat of disease.

Primary inflammation of the musculo-tendinous structure of the diaphragm is very rare, though it occurs in the course of acute rheumatism, in penetrating wounds, and in injuries of the chest. Inflammation of the diaphragmatic pleura is much more frequent, and is caused by pleurisy, pneumonia, hepatitis and peritonitis, wounds of the chest and abdomen, fracture of the lower ribs, blows at the base of the chest, currents of cold air on the perspiring body, immoderate laughter, continued crying and weeping, the suppression of rheumatism (Patterson,<sup>1</sup> Portal<sup>2</sup>), the healing of old sores (Aaskou,<sup>3</sup> Boisseau,<sup>4</sup> Selle<sup>5</sup>). Hildebrand<sup>6</sup> considers tight lacing and corsets a cause of this disease.

Diaphragmatic pleurisy would seem to be most frequent in the adult and in women. It is rare in children, though I find cases reported respectively by Graves,<sup>7</sup> Hildebrand,<sup>8</sup> and one by Jacobusch<sup>9</sup> of an infant but five months old. Diaphragmatic pleurisy is more often unilateral, both sides, however, being affected indifferently. Just here it should be stated that beside the primary inflammation of the diaphragmatic pleura spoken of above, there is a form of so-called *acute benign* diaphragmatic pleurisy, first written of at length by Bucquoy,<sup>10</sup> the tendency of which is always toward cure, and of which I shall treat fully later on.

Secondary inflammation of the diaphragm, though generally overlooked, is none the less frequent. It is most often caused by tuberculosis, and is invariably fatal<sup>11</sup> (Andral,<sup>12</sup> Peter,<sup>13</sup> Howe<sup>14</sup>). It occurs also in those recovering from acute rheumatism (Patterson, Portal, Dubois,<sup>15</sup> Peter<sup>16</sup>). It is usually double and not necessarily fatal. General or partial peritonitis often lights up a secondary inflammation of the diaphragm (Peter,<sup>17</sup> Cuffer,<sup>18</sup> Foix<sup>19</sup>); and Herndon<sup>20</sup> relates a case of perforation of the diaphragm following severe peritonitis. Pitres<sup>21</sup> and Lancereaux<sup>22</sup> were the first to call attention to puerperal peritonitis as a cause of diaphragmatic pleurisy; this form of the malady is always fatal. Charrier,<sup>23</sup> also, in relating the epidemic of puerperal peritonitis observed at the Maternity Hospital, remarks on the frequent coexistence, in such

<sup>1</sup> Trans. of Med. Soc. of London, vol. v. No. 32.

<sup>2</sup> Acta Soc. Med., Havana, t. i. p. 205, 1777.

<sup>3</sup> Nosographie Organ, t. x, p. 620.

<sup>4</sup> Institutiones Médicale, t. iii. p. 267.

<sup>5</sup> Journ. f. Kinderkrankheiten, 1854, vol. xxii. p. 412.

<sup>6</sup> Berlin. klin. Wochenschr., Oct. 8, 1883.

<sup>7</sup> Chauffaud in Hermil, Paris Thesis, 1879, p. 98.

<sup>8</sup> Loc. cit.

<sup>9</sup> Med. Journ. and Gazette, Feb. 1837.

<sup>10</sup> Arch. Général, de Méd., 1871, p. 343.

<sup>11</sup> Bull. de la Soc. Anat., 1874, p. 197.

<sup>12</sup> Wien. med. Presse, 1869, x. p. 990.

<sup>13</sup> Pro. Méd. Française et étrangère, 1879, p. 474.

<sup>14</sup> Loc. cit.

<sup>15</sup> Loc. cit.

<sup>16</sup> Clinical Medicine, 1863, vol. ii.

<sup>17</sup> Leçons Clinique, Paris, 1873.

<sup>18</sup> Gaz. des Hôp., 1875, p. 1065.

<sup>19</sup> Paris Thesis, 1876.

<sup>20</sup> Union Médicale, 1856, p. 562.

<sup>21</sup> Paris Thesis, 1874.

<sup>22</sup> Bull. de la Soc. Anat., 1875.

<sup>23</sup> Paris Thesis, 1855.

cases, of inflammation of the diaphragmatic pleura. Hervieux,<sup>1</sup> Hilton Fagge,<sup>2</sup> Foix,<sup>3</sup> Laroyenne,<sup>4</sup> Coyne,<sup>5</sup> and others, all remark the frequent production of this disease by puerperal peritonitis, agreeing that the inflammatory products are usually carried by means of the lymph channels, and that the pleurisy is caused directly by a peritoneal abscess which breaks through the diaphragm.

As to the so-called epidemics of diaphragmatic pleurisy observed by Sagar in 1770, and by Boerhens in 1819, it may be said that the epidemics in question were most probably typhoid fever with peritonitis, followed by inflammation of the diaphragmatic pleura. Finally cysts, abscesses, and cancer of the abdominal viscera are often the direct cause of a diaphragmatic pleurisy.

As to the frequency of this disease, it must be confessed that it is not very rare. Laurence, Andral, Peter, and de Mussy think it by no means uncommon. It is impossible to give the exact number of cases on record; speaking generally, it is less than one hundred. Doubtless its apparent rarity arises from a failure on the part of physicians to recognize the disease, or, when diagnosticated, to put on record.

**SYMPTOMATOLOGY.**—The onset of diaphragmatic pleurisy is variable. It is usually ushered in by a chill of greater or less violence, followed by fever and sweat. Secondary pleurisy, arising in the course of acute or chronic disease, is marked by an increase of the fever or by a distinct chill; but it is the pain and the characteristic symptoms which follow, that attract attention. In perforation of the diaphragm by bursting of an abscess of the liver, for instance, violent pain and dyspnoea are the prominent symptoms. Intense pain in the side and constriction of the lower part of the chest, soon follow the chill. The pains of diaphragmatic pleurisy are characteristic, and are to be referred to the terminal filaments of the phrenic nerve; they are what Hermil calls “douleurs par propagation.”

If we call to mind the anatomy and distribution of the phrenic nerve, we can explain many of the peculiar symptoms found in inflammation of the diaphragmatic pleura. It arises from the third and fourth cervical nerves, receiving a branch from the fifth, and runs through the chest to the diaphragm, where it divides into branches which pierce that muscle separately, and are distributed to its upper and under surface. The nerve, besides its connection with the nerves of the neck and shoulder, supplies filaments to the pericardium and pleura; near the chest it is joined by a filament from the sympathetic and by one from the fifth and sixth cervical nerves. It is also connected with the solar and hepatic plexuses, and gives off filaments to the peritoneum and the suprarenal capsules.

<sup>1</sup> *Traité clin. et prac. de mal. puerperale*, Paris, 1870.

<sup>2</sup> *Guy's Hospital Reports*, 1879, vol. xix.

<sup>4</sup> *Lyons Méd.*, 1877.

<sup>3</sup> *Loc. cit.*

<sup>5</sup> *Bull. Méd. du Nord*, 1877.

The pains of diaphragmatic pleurisy extend, as might be expected, over a large surface—over the whole hypochondriac region and over both flanks to the inferior dorsal region behind, following the line of the costal insertions of the diaphragm, and often along the border of the sternum and under the lower insertion of the sterno-cleido-mastoid muscle, and over the shoulder and neck. The pains may be spontaneous, but are always evoked by pressure or by increased respiratory movements, hiccough, vomiting, etc. According to de Mussy,<sup>1</sup> the favorite seats of pain on pressure are over the epigastrium, at the points of insertion of the tendons of the diaphragm; in the last intercostal space behind, near the spine; along the course of the phrenic nerve; and, finally, at what he calls "*le bouton diaphragmatique*," where the pain is always especially great. De Mussy localizes this spot at a point one or two fingers' breadth from the middle line, on a level with the tenth rib, or at the intersection of a line drawn from the osseous part of the tenth rib and one drawn along the border of the sternum. He explains the greater pain at this point by the greater play of the rib and consequent friction against the inflamed nerve.

The pressure of the liver and spleen on the inflamed pleura serves to explain the pain felt over these organs. The pain along the trunk of the phrenic nerve, referred to above, is rarely spontaneous, but is always evoked by pressure, and especially is this so at the point where the nerve runs under and between the inferior division of the sterno-cleido-mastoid muscle. De Mussy gives a case where great pain was spontaneous at this point. This hypersensibility of the phrenic nerve is explained by its partaking of the inflammation of the diaphragm. Pressure in the intercostal spaces also gives rise to pain. The pains of propagation—the reflex pains—run along the sides, downward even to the iliac fossa, but are usually more intense in the upper part of the body. They are sometimes felt with special intensity in those muscles connected by their nerves with the cervical and brachial plexuses. Supraclavicular pains are generally severe, as well as those in the shoulders and over the scapula and the trapezius muscle generally, the nerves of this entire region being connected through the fourth cervical with the phrenic, as we have stated. The pain referred to the axillary region comes from the connection of the phrenic with the internal cutaneous and the brachial plexus.

Hypersensibility of the phrenic nerve is also sometimes observed in inflammation of the costo-pulmonary pleura and in pericarditis; and it sometimes precedes acute inflammation of these organs and of the diaphragm. Absence of spontaneous and provoked pain at the various parts mentioned was noticed by Graves;<sup>2</sup> and, indeed, in his case pressure upon the painful spots relieved the pain. It seems that in cases of

<sup>1</sup> Arch. Général. de Médecine, 1853, vol. ii. p. 274.

<sup>2</sup> Loc. cit.

double diaphragmatic pleurisy the pain is always greater on one side than the other. As to the frequency of pain in any given place, that in the hypochondriac region is most often present. In 40 cases given by Hermil, visceral pain was present in 15 cases, special pain at the "bouton diaphragmatique" in 9 cases, pain under the sterno-cleido-mastoid muscle in 20 cases, supraclavicular pains in 7 cases, in shoulder 11 cases, and pains in the axillary region in 2 cases.

The attitude of a person with diaphragmatic pleurisy is very characteristic: The dorsal position being impossible, the body is bent forward, and the hands are applied to the sides in order to immobilize the diaphragm as much as possible. The expression is one of great anxiety and suffering; this peculiar pinched, painful look is more marked where there is a coexistent peritonitis. The convulsive movement of the muscles of the face and mouth, the *risus sardonius*, is often present, though it is not, of course, as was formerly supposed, a diagnostic symptom of this disease. The most distinctive and prominent symptom in diaphragmatic pleurisy is the frequency and shallowness of the respiratory movements. They are short, aborted, and accompanied with great pain and discomfort to the patient. Respiration is entirely costal and limited, even then, to the upper part of the chest; and, indeed, it may be limited to one side, as in a case given by de Mussy. The number of respirations is, of course, greatly increased, running as high as 80 or 100 (Hayden<sup>1</sup> and Graves<sup>2</sup>). The great trouble and pain in breathing arise, of course, from the interruption in the play of the inflamed diaphragm, kept immobile either by the patient himself, or by a complete or partial paralysis of the structure itself. Paralysis of the diaphragm in such cases is caused directly by the inflamed condition of its pleural surface (a condition somewhat akin to the paralysis of the palate following diphtheria, Stokes),<sup>3</sup> or by a compression of the phrenic nerve by the fibrinous exudation. Again, although there may be no paralysis as such, the effusion may be so large as greatly to embarrass diaphragmatic action. The immobility of the diaphragm in these cases, from whatever cause, is an interesting and instructive symptom, and is the direct cause of the retraction of the hypochondriac region invariably seen in diaphragmatic pleurisy. This sign was held by Galen and the ancients as pathognomonic of this disease. Selle<sup>4</sup> remarks it, and Van Swieten<sup>5</sup> speaks of the *quiescente abdomine*. The diaphragm being to a great extent immovable, it forms a more or less elastic division between the chest and abdomen, the movements of which are in opposition to each other, and are exactly the reverse of those of normal respiration. The

<sup>1</sup> Dublin Quarterly Journ., 1871, vol. lli.

<sup>3</sup> Dublin Quarterly Journ., 1836

<sup>5</sup> Commentaria in Aphor. Boerhaave, vol. ix., 1771.

<sup>2</sup> Loc. cit.

<sup>4</sup> Loc. cit.



paralyzed diaphragm is an inert partition, which follows the respiratory movements instead of directing them.

Paralysis of the diaphragm, however, is rarely complete and usually unilateral, and in most cases the immobility of the diaphragm is due to the pain caused by any superfluous movement. Of course, the effusion may be so great as to cause not only a paralysis, but a complete sagging of the diaphragm, and great displacement of all the abdominal organs, as in a case of pyopneumothorax seen by the author.

Respiration being so much impeded, auscultation gives very negative results. Great enfeeblement of the respiratory murmur on the affected side, a few subcrepitant râles at the base of the lung from its imperfect expansion and involvement in the inflammation of the adjacent pleura, and pleural friction sounds over the diaphragmatic area, are the only signs present to the ear. Laennec declared ægophony to be present in diaphragmatic pleurisy on theoretical grounds, and the experience of Skoda would seem to confirm the statement. More or less dulness immediately around and above the diaphragm is present on percussion.

The cough is frequent, dry, and exceedingly painful; the expectoration slight and thin. Where the inflammation extends to the costo-pulmonary pleura, we have, in addition, all the signs of this affection. In cases of diaphragmatic pleurisy with effusion, de Mussy gives, as an important symptom, the *lowering* of the twelfth rib, so that its anterior end is lower than that of the twelfth rib on the opposite side. This sign is given by Chauffaud in a case quoted by Hermil.<sup>1</sup> In cases of effusion there may be slightly increased Skodaic resonance on percussion over the attachments of the diaphragm.

Hiccough is often a distressing symptom in this malady, and was at one time considered diagnostic. It has no absolute value, however, for it is also present in circumscribed peritonitis of the superior part of the abdomen. Sometimes it is present from the very beginning in inflammation of the diaphragm; Vergely<sup>2</sup> gives such a case, which was rapidly fatal. Nausea and vomiting, too, are often extreme, and icterus has been noticed in two cases of right diaphragmatic pleurisy by Hermil,<sup>3</sup> and also by Andral<sup>4</sup> and Monod.<sup>5</sup> It is, of course, caused by the extension of the inflammatory process from the diaphragm to the liver.

Dilatation of the stomach has been met with by Peter,<sup>6</sup> who was the first to call attention to it as a complication of this disease, and also by Laporte.<sup>7</sup> It proceeds from an inflammation of the peritoneal covering of the stomach, which later invades the muscular structure of this organ,

<sup>1</sup> Loc. cit., p. 98.

<sup>3</sup> Loc. cit.

<sup>5</sup> Hermil, p. 77.

<sup>6</sup> Clin. Méd., vol. i. p. 400, and Journ. de pract. méd. et Chir., 1874, p. 299.

<sup>7</sup> Paris Thesis, 1869.

<sup>2</sup> Gaz. des Hôp., 1873.

<sup>4</sup> Loc. cit.

causing it to lose more or less of its tonicity, and to be easily distended by gases, etc. Violent pain when a bolus of food passes the œsophagus at its passage through the diaphragm is a symptom sometimes met with in diaphragmatic pleurisy.

Great delirium is often present, though it is not an essential symptom of this disease, as was formerly supposed. That it is present more often in this malady than in costo-pulmonary pleurisy is explained by the greater dyspnoea and want of aëration of the blood. Coma sometimes sets in at once, in which case the disease runs rapidly to a fatal termination. The pulse is small and rapid. The temperature runs usually from 38° to 39° Centigrade, though it rises much higher when the diaphragmatic inflammation is complicated with some other malady.

The course of diaphragmatic pleurisy is variable. In primitive cases the invasion is rapid, the symptoms reaching their greatest intensity quickly, and subsiding in the same manner. Double pleurisy rarely begins as such, one side being affected first. Secondary pleurisy is often complicated by pericarditis, peritonitis, etc., and generally ends fatally. The duration, too, is variable; the acute symptoms are more prolonged than in ordinary pleurisy. The neuralgic pains along the course of the phrenic nerve often continue for a long time, with tenderness over the insertions of the diaphragm.

DIAGNOSIS.—The *diagnosis* of diaphragmatic pleurisy is at best difficult and uncertain; and unless great care be taken, the disease will pass unrecognized. The diagnosis cannot be founded on any one particular sign or symptom. Andral went so far as to say that inflammation of the diaphragm might exist without being announced by any characteristic symptom. De Mussy, however, holds that by careful differentiation we may always arrive at a satisfactory diagnosis. He lays great stress on the value of the “diaphragmatic button,” for in no other malady does pressure on this particular point cause pain and dyspnoea. The prominent symptoms, then, to be looked for, are spontaneous and provoked pains in the places and regions already described; immobility of the abdominal walls and the epigastric “hollow;” the peculiar type of respiration; dullness on percussion over the diaphragmatic area; pleural fremitus; absence of respiratory murmur; hiccough; vomiting; pleuritic cough, etc. Nearly all the authors, from Galen to Joseph Frank, have discussed the relation between diaphragmatic pleurisy and pleuritis or meningitis. Morgagni<sup>1</sup> and De Haen<sup>2</sup> give observations to prove that delirium may be entirely absent in the former disease. Joseph Frank<sup>3</sup> goes further, and declares that delirium and sardonic laugh belong no more to this affection than to inflammation of other organs. De Mussy, however, thinks (as do most observers) that delirium is more frequent in diaphrag-

<sup>1</sup> Loc. cit.

<sup>2</sup> Loc. cit.

<sup>3</sup> Loc. cit.

matic than in costo-pulmonary pleurisy. Again, the absence of the positive signs and symptoms of disease in other and adjacent organs, must be well noted. In cases of greater or less effusion, the diagnosis is less difficult, because of the displacement of the liver and spleen, and of the abdominal organs generally.

Acute diaphragmatic pleurisy is to be differentiated from

I. *Rheumatism of the diaphragm.* Rheumatism of this structure is pyretic, the fever gradually increases for from one to eight hours,<sup>1</sup> and the acute symptoms terminate spontaneously and without complication. It is unaccompanied by pain on percussion at the points described above, the pain being limited to the insertions of the diaphragmatic muscle.<sup>2</sup>

II. *Inflammation of the muscular structure of the diaphragm itself.* Such a diagnosis it is almost impossible to make, though it is to be remembered that the latter is a very rare affection, and results from wounds or abscesses only.

III. *Neuralgia of the diaphragm,* which in itself is often a symptom or result of acute inflammation of the diaphragm. When it is present, we must get at its cause, whether it is dependent on some affection of the heart, or great veins, or on anæmia, hysteria, etc. The absence of fever, however, the side affected, and the intensity of provoked pains will greatly assist in diagnosis.

IV. *Costo-parietal pleurisy.* In this disease, though the pain in the side is as great as in diaphragmatic pleurisy, the seat of the pain is higher up, and, above all, it is accompanied by the well-known percussion and auscultatory signs which are wanting in diaphragmatic pleurisy. Of course, they may and do exist together. Peter<sup>3</sup> gives a case of diaphragmatic pleurisy with encysted effusion in a phthisical patient which was overlooked and mistaken for caseous pneumonia on account of the compression of the lung by the fluid.

V. *Pericarditis.* In pericarditis we sometimes have pain along the course of the phrenic nerve; when such pain is present, however, the heart affection is complicated by some other disease, as in a case recorded by Bouillaud<sup>4</sup> of a pericarditis with purulent pleurisy, involving the diaphragm. De Mussy gives the differential character of the pain in diaphragmatic pleurisy and pericarditis somewhat as follows: Whereas, in the former the principal point of pain is in the "bouton diaphragmatique," on the right side, in the latter it is in the costo-ziphoïd angle, on the left side, and immediately under the ziphoïd appendage. The dyspnœa, too, is much less in pericarditis, and the physical signs on auscultation and percussion are distinctive, though the pericarditis may be concurrent

<sup>1</sup> Chenevier, Gaz. des Hôp., 1858.

<sup>2</sup> Fernet, N. Dict. de méd. et Chir. prat., Paris, 1869, xi. 344.

<sup>3</sup> Gazette des Hôp., 1875, p. 1065.

<sup>4</sup> Traité Clin. d. Rheu. Artic., Paris, 1840.

with an inflammation of the left side of the diaphragm; eight such cases are reported by Hermil.

VI. *Hepatitis*. Right diaphragmatic pleurisy, with icterus, bilious vomiting, and displacement of the liver, may naturally be mistaken for acute hepatitis, which last, however, is a very rare disease with us. In it there are no painful points as in pleurisy, no great dyspnœa, no difficulty in the dorsal position; further, the pain produced by the pressure of the enlarged liver on the diaphragm is distinct from that produced by inflammation of the diaphragm itself.

VII. *Circumscribed peritonitis* of the superior part of the abdomen. A differential diagnosis in this case is often very difficult, for the affections have in common the superficial pain over the abdomen, increased by pressure, the radiating pains extending from below upward even to the shoulder. The pulse in both is very small and frequent, and dyspnœa, hiccough, vomiting, dilatation of the stomach, icterus in cases of perihepatitis, all are sometimes present in peritonitis.

In peritonitis, however, we must seek for those symptoms apparently the least prominent; the functional troubles of each viscus found in peritonitis, and, above all, we must look for the antecedent cause of inflammation of the peritoneum, as cirrhosis, and cancer of the liver, or other organs. Thus, in a case given by Hermil,<sup>1</sup> though the physical signs and symptoms were very misleading, the extreme dyspnœa, with absence of tumefaction on the right side, and of any swelling of the abdomen; and absence of vomiting and icteric taint; the consolidation of the bases of both lungs and the characteristic pains over the bouton diaphragmatique, settled the diagnosis of diaphragmatic inflammation. Furthermore, it would seem that whenever hiccough exists in peritonitis, it is always followed by vomiting (Charrier<sup>2</sup>). Peritonitis according to Foix<sup>3</sup> and Hilton Fagge,<sup>4</sup> is often complicated with diaphragmatic pleurisy, and in such cases the diagnosis is very difficult. Hervieux<sup>5</sup> says that the absence of cough and expectoration, of lung consolidation, and auscultatory signs, is sufficient. Again, it is very difficult to distinguish an encysted supradiaphragmatic effusion from a subdiaphragmatic collection (Donaldson).<sup>6</sup>

COMPLICATIONS AND TERMINATIONS.—Diaphragmatic pleurisy is usually complicated with pneumonia, costo-pulmonary pleurisy, pericarditis, perihepatitis, and perisplenic peritonitis. Williams<sup>7</sup> says that peritonitis following diaphragmatic pleurisy is rare, though he gives a case of general peritonitis with inflammation of the under surface of the diaphragm following this disease. Cailliet<sup>8</sup> also gives two cases of fatal

<sup>1</sup> Loc. cit., p. 60.

<sup>2</sup> Paris Thesis, 1855.

<sup>3</sup> Paris Thesis, 1874.

<sup>4</sup> Guy's Hospital Reports, 1873.

<sup>5</sup> Loc. cit.

<sup>6</sup> Pepper's System of Medicine, Art. Pleurisy, p. 563.

<sup>7</sup> Soc. Méd. des Hôp., 1873.

<sup>8</sup> Paris Thesis, 1874.



peritonitis produced by inflammation of the diaphragm. Petit,<sup>1</sup> too, gives a case of perforation of the diaphragm, with fatal peritonitis, following a diaphragmatic pleurisy. The termination in primitive cases is in cure, as will be seen later. In secondary cases it is usually fatal, about one-fourth only of such cases recovering. When an effusion forms, it is either absorbed or becomes purulent, and the patient either lingers a long time, or the collection becomes encysted. In the latter case, it either remains inert, producing no particular bad effects, and attracting no attention, to be found after death from other causes (Graux,<sup>2</sup> Boisseuil<sup>3</sup>); or it ulcerates through the diaphragm, causing death (Andral<sup>4</sup>). Or, again, it may be ejected through the lungs. Grisolle<sup>5</sup> gives a case where the pus of an encysted effusion was evacuated partly through the lungs and partly through the lumbar region, and which resulted in cure. De Mussy<sup>6</sup> also tells of two cases of cure after evacuation of the pus through a bronchus.

PROGNOSIS.—Briefly, in primitive pleurisy, the tendency is toward cure. In secondary cases the prognosis is always grave, especially where it occurs in those of tubercular diathesis, and in cases of great delirium, obstinate hiccough, and of bilious vomiting; of excessive dyspnoea and of a purulent effusion. Double diaphragmatic pleurisy is not, as a rule, of grave import. Inflammation of the left side of the diaphragm is of more serious import, owing to the occasional involvement of the pericardium. Pleurisy occurring in the course of puerperal fever is extremely fatal.

It only remains for us to speak of the so-called benign form of diaphragmatic pleurisy to which attention was first called by Bucquoy,<sup>7</sup> and which would seem to be a distinct form of the disease. According to this writer, besides ordinary acute pleurisy, with more or less effusion, and that accompanying bronchitis or catarrhal pneumonia, with little or no effusion, and lasting a short time, there exists a separate and distinct form of acute benign diaphragmatic pleurisy, which always ends in cure. Hermil<sup>8</sup> agrees with Bucquoy in this opinion, and says that he has seen a number of such cases. I find also that the articles on inflammation of the diaphragm published since 1879 treat exclusively of this somewhat peculiar and interesting form of acute benign pleurisy. Bouchut<sup>9</sup> confirms Bucquoy's statements, and gives three cases of acute benign diaphragmatic pleurisy, all ending in cure. Monod<sup>10</sup> and Robert<sup>11</sup> each re-

<sup>1</sup> Bull. de la Soc. Anat. de Paris, 1866, xli. p. 497.

<sup>2</sup> Bull. d. l. Soc. Méd. de Paris, 1874, p. 478.

<sup>4</sup> Loc. cit., vol. ii. p. 465.

<sup>6</sup> Arch. de Méd., July, 1879.

<sup>8</sup> Loc. cit., p. 50.

<sup>10</sup> Gaz. Heb. d. Sc. Méd. de Bordeaux, 1880, i. p. 751.

<sup>11</sup> Revista de Ciencias Medicas, Barcelona, 1881, xii. p. 3.

<sup>3</sup> Paris Thesis, 1876.

<sup>5</sup> Path. Interne, vol. i. p. 438.

<sup>7</sup> Leçons Clinique, etc., Paris, 1873.

<sup>9</sup> Paris Méd., June 17, 1880.

port one case identical with the above; and Fiessinger<sup>1</sup> nine cases, all ending in rapid and complete recovery.

Acute benign diaphragmatic pleurisy begins, as does ordinary pleurisy, with chill, pain in the side, and fever. The painful points and radiating pains, the tender and retracted abdomen, etc., follow, and show conclusively that the inflammation is of the diaphragmatic pleura. Up to the third day the inflammation is limited to one side only, but from the third to the sixth day it extends, and we find the opposite side of the diaphragm involved. Its invasion of the other side is accompanied, however, by no great pain, and indeed all the symptoms are much less than those of the side first affected. There is some slight consolidation of the lung bases with enfeebled respiration; there is but slight effusion and little displacement of the liver and spleen. While all the symptoms are much less pronounced on the side last affected, the effusion on the side first involved rises to a much lower level than that of the opposite side. On the side first attacked we usually have a certain amount of retraction of the base of the lung from the presence of the fluid between it and the diaphragm. This fluid, however, does not always occupy this place, but by reason of the retractility of the lung, which draws the fluid upward with it, the liquid is spread out, as it were, between the lung and the thoracic wall, and so we may have the physical signs of a large effusion, though, in fact, the amount actually thrown out is quite small. As a rule, in benign pleurisy the bilateral effusion disappears without surgical intervention, and the dyspnoea, in spite of the double pleurisy, is but slight.

Another interesting feature of this benign form of diaphragmatic pleurisy is that the last pleurisy developed is the first to disappear. Pending its duration, however, there is little or no progress of the disease on the side first attacked. The development of the second pleurisy would seem to arrest the first, and the tendency is toward rapid cure. There is, in general, but little systemic disturbance, and the fever is moderate in this form of the malady. The extension of the inflammation from one side to the other seems to lessen all the bad symptoms. All such cases result in cure in from two to four weeks (Monod,<sup>2</sup> Hermil<sup>3</sup>).

<sup>1</sup> Rev. Méd. de l'est., Nancy, 1885, xvii. p. 332.

<sup>2</sup> Du Hermil, pages 73 to 77.

<sup>3</sup> Loc. cit., p. 66.

## ATROPHY OF THE STOMACH, WITH THE CLINICAL FEATURES OF PROGRESSIVE PERNICIOUS ANÆMIA.

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ALTHOUGH for many years past the attempt has been made to associate certain cases of profound anæmia with wasting and degeneration of the gastric tubules, the occurrence of a primary atrophy of the mucous membrane of the stomach is still doubted, and probably the majority of pathologists agree with the statement of Welch, in his recent article on this subject in Pepper's *System of Medicine*, "that the existence of atrophy of the stomach as a primary and independent disease has not been established."

The following interesting case is offered as a contribution toward the solution of the question:

Samuel I., white, male, æt. forty-two, was admitted to the Episcopal Hospital on June 15, 1885. Seven weeks before this date he began to complain of weakness, loss of appetite, and perverted sense of taste—"everything tasted like pepper." Dyspnœa was also a prominent symptom. On slight exertion he would be seized with vertigo, and be compelled to sit down. There is no record of hemorrhage from any part of the body. There was, and still is (at date of admission), a tendency to constipation, the bowels being moved every other day. In the autumn of 1860 he had an attack of tertian intermittent. After treating himself with domestic remedies, among which vinegar and salt seem to have occupied a foremost rank, he was cured by Peruvian bark and port wine. Twenty-four years ago he had a venereal sore, followed by two suppurating buboes, but without other secondary symptoms.

He was on the police force from 1872 to 1880, during which period and subsequently, up to December, 1884, he was in the habit of drinking freely—"twenty to thirty drinks daily," many of them before breakfast—and eating at irregular hours. After leaving the police he drove an ice wagon, and was afterward a cab-driver. Eight years ago he had an attack of gonorrhœa. In 1876 he weighed 305 pounds, and was a prominent figure at a "fat-men's ball." His height is six feet two inches. In 1877 he began to grow thin, and continued to lose flesh at the rate of one, two, and three pounds daily. He was in the habit of weighing himself on the same scales in a shop in his district. He once during this period of rapid diminution of weight, lost seven pounds in twenty-four hours. This loss of flesh continued with intermissions for eight or nine months, until his weight was reduced to 147 pounds, when he began to regain, and in a year thereafter weighed 180 pounds. The patient's memory of the exact dates of these fluctuations in his bodily weight is not absolutely accurate, though sufficiently so for the purpose

of this clinical history. He attributed his loss of flesh to indigestion. At the period referred to, he was in the habit of vomiting almost invariably after taking food, and was frequently obliged to leave the table hastily on this account. His weight at time of admission was 139 pounds.

His skin possesses the peculiar yellowish pallor that is almost pathognomonic of pernicious anæmia, and the ocular conjunctiva is of the characteristic yellow hue, which differs, however, from the tint of icterus. The palpebral conjunctiva is milky-white, apparently bloodless. The skin of the abdomen is flaccid, and easily gathered in folds by a grasp of the hand, which fact is corroborative of the patient's statement regarding his former obesity. This statement, however, is proved by the best possible evidence, that of photographs in his possession. His girth was once fifty-two inches, and is now thirty-two. The patient dates his illness from a period about eight weeks prior to his admission to hospital. It began with dizziness, nausea, palpitation of the heart, and a sense of great weakness. These symptoms have continued up to date of admission.

The results of physical examination are, for the most part, negative. The heart sounds are very feeble and distant, and unaccompanied by murmur or *bruit*. The lungs are free from any sign of disease. There is neither tenderness nor increased area of dulness on percussion over liver or spleen. There is decided tenderness over middle of sternum, and a tender spot was also found on one of the lower ribs when making percussion in the splenic region. There is no enlargement of the lymphatic glands. The tongue is exceedingly pale in the centre, with pink edges and tip, but without fur. The urine contains a minute trace of albumin; its reaction is acid; its specific gravity 1.020; it is free from sugar and bile pigment. On June 16, 17, and 18, the temperature rose above normal: on the first of these dates to  $101^{\circ}$ , and on the two latter to  $102^{\circ}$ , in the evening. After the 18th the temperature was normal, while in hospital.

*June 17.* First examination of blood. Number of red globules per cubic millimetre, 790,000. Proportion of white to red, 1 to 158. The percentage of red globules, as compared with the normal number (5,000,000), that is to say, the "hæmic unit," is 15.8.

The majority of the globules are larger than normal and many of them are pear-shaped and oval. Microcytes present in considerable quantity. Schultze's granule masses scantily present. The color, as tested by Gowers's hæmoglobinometer, is 16 per cent.; therefore, the amount of hæmoglobin is relatively normal. This is a cardinal feature of pernicious anæmia. In all other forms of anæmia, the percentage of hæmoglobin is lower than that of the red globules. In pernicious anæmia, it generally equals, frequently exceeds, and has been observed by Laache to be double, that of the blood globules.

*18th.* An ophthalmoscopic examination was made by Dr. Albert G. Heyl, one of the ophthalmic surgeons to the hospital: "Both optic disks free from swelling, margins clear and distinct. In R. E. arteries of normal calibre, veins of increased calibre, at least double the size of arteries. A large hemorrhage, for the most part decolorized, was seen above the disk, and a more recent one upward and inward, in some places quite dark, in others of a raspberry-red. In L. E. the main upper vein was very full and inclined to be tortuous. The corresponding artery was abnor-



mally full. A hemorrhage was seen below the disk. The media were quite clear. The condition is that of engorgement of the retinal vessels, with hemorrhages such as occur in anæmia."

24th. Number of red globules per c.m., 1,195,000. Hæmic unit, 23.9. Color, 20 per cent. No white seen. The red globules vary greatly in size and shape, being oval, pear-shaped, and generally of irregular outline. Some of them are four times the normal size. There is a moderate number of microcytes.

The date on which the patient left the hospital is not preserved, but there are notes of a visit to him at his own home on June 26th, so that his stay in hospital did not exceed two weeks.

July 2. Came to have his blood examined, walking a distance of nearly two miles. Was not fatigued, but complained of a slight "numbness" in the legs. Number of red globules per c.m., 1,215,000. No white seen. Hæmic unit, 24. Color, 28. Globules abnormally large and irregular.

6th. Patient had an attack of diarrhœa, which began the day before (Sunday), although he had felt uneasiness in bowels since Friday, and had stopped his medicine in accordance with directions. He had been taking Fowler's solution, and had reached eight drops thrice a day, when diarrhœa set in.

7th. Sent for. He had five watery stools the day before, and one large, liquid, very offensive stool to-day. During the night, about 1.30, he had a decided chill. Pulse full and bounding, 112; skin hot and perspiring slightly; temperature 103.2°. Ordered 2½ grs. quiniæ sulph. every three hours, and suppository of half a grain extract. opii aq. every three hours until diarrhœa is checked.

8th. Has had thirteen stools since 12 M. the day before, but feels decidedly better, owing to subsidence of the fever. Pulse 80; temperature 99.8°. Wishes to get up.

10th (Friday). Sitting up and looking worse. Has had forty watery, offensive stools since Tuesday morning, five between 4 and 9 A.M. None since 9, when last suppository was used.

12th. Came to have his blood examined. Not so much fatigued as when he came on July 2d, which, considering the recent attack of diarrhœa, is remarkable. Number of red globules per c.m., 1,635,000. Globules, for the most part, much larger than normal, and of irregular shapes. No white in specimen. Hæmic unit, 32.5. Color, 40.

20th. Number of red globules per c.m., 1,605,000. Globules mostly very large, some of them three times the normal size, and very irregular in shape; a few microcytes. Hæmic unit, 32. Color, 30. The count is almost the same as the last, although the patient feels decidedly better, and walks considerable distances without fatigue, in spite of the intense heat now prevailing; the thermometer to-day reached 100° F., in the shade. His appetite is good, and the bowels are moved once daily. Ordered ferri pyrophosphat., gr. iiss *ter in die*.

Aug. 2 (Sunday). On Thursday patient came to have his blood examined, but it could not be done at that time. On his way home he drank a glass of buttermilk and soon after swallowed a plate of mock-turtle soup and a glass of lemonade. The consequence was an attack of cholera morbus the same evening. He treated himself with laudanum and blackberry brandy, and by next day the attack had ceased. On Friday he weighed 135 pounds. Number of red globules per c.m.,

1,640,000. Hæmic unit, 32.8. Color, 36. Average size of corpuscles still decidedly above normal. Very few microcytes. No granule masses. Shape of globules less irregular. No white cells seen.

10th. About the same. Blood not examined. Hydroleine prescribed.

15th. Feels much better. Weighs 140 pounds. Talks of getting to work—cab-driving. Has walked a distance of two miles without fatigue during the past week. Appetite good and bowels regular. Did not take hydroleine, but, by advice of an officious friend, took elix. ferri, quiniæ, et strychniæ phosphat., instead. Number of red globules per c. m., 1,805,000. Hæmic unit, 36. Color, 32. No white seen. Patient looks very pale and ghastly.

Sept. 2. Has been working as a street-car conductor for a week, getting up at 3.30 A. M., and working until late at night. Got along very well until two days ago, when an attack of diarrhœa compelled him to stop work.

12th. Working again as car conductor. Rises at 4 A. M. and does not get to bed until one o'clock next morning. He has, therefore, if his statement is correct, only three hours in bed. "Never felt better in his life," but looks exceedingly pale and thin. No. of red globules per c. m., 1,470,000. Hæmic unit, 29.4. Color, 35.

Oct. 21. No. of red globules per c. m., 1,255,000. Hæmic unit, 25. Color, 20. White corpuscles to red as 1 to 500. Globules large and irregular. Patient complains of great weakness in legs on walking short distances. Has been continuously at work as car conductor, though not on full time.

Nov. 19. Sent for, and found him lying down though dressed. Has not worked for a month and is exceedingly feeble. Has followed no regular treatment whatever, being incorrigible in this respect. Has taken lately some pills called "tree of life," which purged him freely and reduced his little remaining strength. He complained of difficulty in passing water, and stated that some years ago he had been treated for stricture by the late Dr. Maury. Passed a No. 15 (French) catheter and drew off a little limpid urine. No blood followed passage of instrument. (About ten days later No. 21 was passed without difficulty.) His quarters are very confined and dark, and exceedingly noisy from continual passage of Pennsylvania R. R. trains almost directly overhead.

Dec. 10. Sent for late at night on account of alarming dyspnoea. When visited he was relieved, the relief having succeeded the belching of large quantities of wind.

17th. About the same. He had apparently sent to inquire whether there was any prospect of his recovery. Ordered vin. ferri amar., ʒss, and liq. potass. arsenit., *miss. ter in die*.

21st. Worse. Diarrhœa began during the night and has weakened him considerably. This has been the invariable result of attempts to administer arsenic. The diarrhœa, which amounted to seven or eight watery stools, was checked by fifteen drops of laudanum. Ordered liquor ferri dialysat., gtt. v *ter in die*, to begin to-morrow, if diarrhœa does not return.

28th. Exceedingly pale and feeble. No conveniences at house for examination of blood. Taking ten drops of solution of dialyzed iron thrice daily.

On Jan. 5th, through the kindness of Dr. S. Weir Mitchell, he was admitted to the Summer St. Hospital. For several days before, he had

been exceedingly weak, unable to sit up, and complaining of a sense of utter prostration.

*10th.* He lay in a semi-comatose condition, from which he could be partially roused, but was unable to recognize any person. The pulse eighty, very small, soft, and compressible, and the respirations deep and sighing.

Number of red globules per c. m., 315,000. Owing to the extremely pale tint of the blood, the color test could not be employed. The count was made at three o'clock. At half-past four, Dr. T. G. Morton injected into the left internal saphenous vein, at about the junction of the middle and lower thirds of the leg, fifteen fluidounces of a solution of sodium chloride, 100 grains to the quart of distilled water. Present: Drs. Hunt, Cantrell, T. S. K. Morton, and Orville Horwitz. Toward the close of the operation, which, it is needless to say, was performed with the greatest skill, the patient became restless, and opened his eyes, but could not reply to questions. Pulse before and after transfusion unchanged in frequency (80), but somewhat fuller after the operation. 8.30 P. M., patient in condition of heavy stupor; pupils moderately dilated; pulse extremely weak, but still 80 per minute; respiration labored and sighing, but not stertorous. Died at 12.30, four hours later.

*Autopsy*, eleven hours after death. Rigor mortis present. Considerable emaciation. Cicatrices on glans penis. Panniculus not more than half an inch in thickness; fat of a deep yellow color. Great pallor of skin and all organs. *Muscles* of a light red tint. In *abdominal cavity*, peritoneum smooth; small amount of a dark yellow serum; the intestines distended with gas. In *right pleura* general adhesions. *Pericardium* covered with a moderate amount of mediastinal fat; slight excess of fluid in cavity. *Heart* large, right chambers full; walls flaccid; preliminary incisions show in right auricle much pale serum, with a large yellow clot; in right ventricle a colorless clot, infiltrated with serum, closely adherent to trabeculæ and chordæ; ten ounces of a watery blood were collected from these chambers. The left chambers were nearly empty; small thin clots blocked the mitral orifice. On further dissection of the heart, walls of normal thickness; muscle very anæmic, and evidently fatty; right chamber looks dilated; valves normal. *Aorta* not atheromatous; coronary arteries healthy. *Lungs* pale, crepitant throughout; the lower lobes very cedematous, and the infiltration extends to the adhesions which exist between the lobes; frothy mucus in bronchial tubes and trachea.

*Spleen* is slightly enlarged, moderately firm; pulp of a deep purple-red color; the Malpighian corpuscles not evident. *Kidneys* of normal size; capsules detach readily, surfaces a little rough; on section, cut with increased resistance; cortical portions pale; small arteries at bases of pyramids very prominent. The *suprarenal capsules* are of average size, firm; cortical portions of a deep yellow color. *Bladder* contains several ounces of clear urine.

*Stomach* looks natural, contains gas and about an ounce of dark fluid; pyloric orifice firmly contracted, and the ring seems thickened; cardiac orifice normal; length of organ eleven inches; breadth, when opened, eight inches. Walls not increased in thickness; at fundus two to three millimetres, at middle of anterior wall two and a half to three millimetres, and at pyloric zone, ten centimetres from the ring, eight to nine millimetres. General surface of mucosa pale; mucus covers the pyloric



region; there are a few dilated venules in several places. At the fundus the mucous membrane is very thin, smooth, grayish-white in color, tough, and tears with difficulty. No trace of superficial softening. In the middle zone it has the same pale gray aspect, is smooth, and there is an entire absence of the velvet-like appearance of the healthy mucosa. About the middle of the lesser curvature there is an old cicatrix, plainly shown by four or five radiating lines. In the pyloric zone, the mucosa is more vascular and decidedly thicker. Scattered over the surface of the membrane, particularly in the central zone, are numerous small, grayish-white elevations the size of a pin's head, most of them isolated, others in groups, and contiguous ones are joined by narrow lines of tissue projecting half a millimetre above the surrounding surface. Toward the pylorus there are larger, more flattened elevations, separated from each other by shallow areas of a pale gray aspect. With a low-power lens small orifices can be seen in these flattened elevations, and here and there in the smaller nodular projections little orifices and tiny cysts can also be seen. The general surface of the mucosa as examined with a hand lens, has a smooth cuticular appearance; the thin mucosa is readily movable on the muscularis; the submucosa does not appear thickened; and, with the exception of the pyloric region, there is no thickening of the muscular coat.

The œsophageal mucous glands are unusually distinct. *Duodenum* contains a bile-stained mucus. Bile flows freely from the orifice of the duct on compression of the gall-bladder. *Small intestines* contain a thin mucus. The walls of the jejunum look of average thickness; those of ileum thin. Peyer's gland, in the portions examined, normal. The large bowel was not opened. *Liver* looks large, is of a light yellow-brown color; capsule presents patches of thickening. Tissue cuts easily, and contains very little blood. Gall-bladder distended with pale bile. *Pancreas* very large, weighs more than 100 grammes; looks natural, lobules distinct; on section, presents a very normal appearance. *Thoracic duct* normal. The *thoracic* and *semilunar ganglia* have a natural appearance. No enlargement of the *bones*. *Marrow* of ribs and sternum of a deep purple-red color. That of lower portion of right tibia lymphoid, the cancellæ at the end of the bone contained fat.

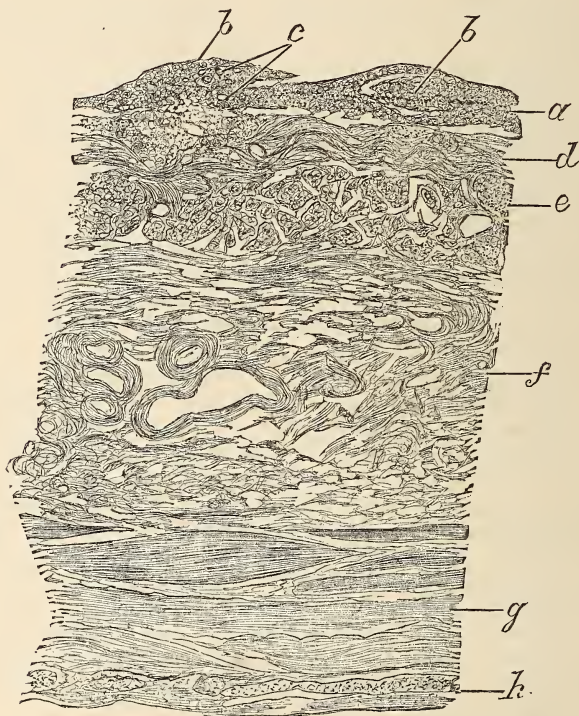
Brain not examined.

**HISTOLOGICAL EXAMINATION.**—*Stomach*. Portions were taken from four different parts and hardened in alcohol. (1) From fundus, where the mucosa looked thinnest and had a very smooth, cuticular appearance. Entire thickness of section about 3.5 millimetres, of which scarcely one-half is made up of the muscular coat. Neither glandular nor epithelial elements of the mucosa occur in the section, but immediately upon the muscularis mucosæ there is a narrow layer (Fig. 2, *a*) of flattened and small round cells, embedded in an indifferent matrix. In the stained preparation the nuclei of these cells are distinct, but the outlines are feebly marked. The muscularis mucosæ shows a remarkable alteration. There are two distinct layers, in the innermost of which the cells are cut longitudinally and form a prominent wavy band of fibres, which are marked even under low powers (Fig. 1, *d*, Fig. 2, *b*). From twelve to fifteen muscle cells can be counted in this band, which varies somewhat in thickness in different places. Below it, forming a much thicker and not so sharply defined layer, are the transverse fibres of the muscu-



laris mucosæ, seen in cross-section, arranged in bundles and groups, separated by more or less connective tissue (Fig. 1, *e*, Fig. 2, *c*). They extend for some distance into the submucosa, and in places there are alternate layers of transverse and longitudinal fibres below the distinct

FIG. 1.

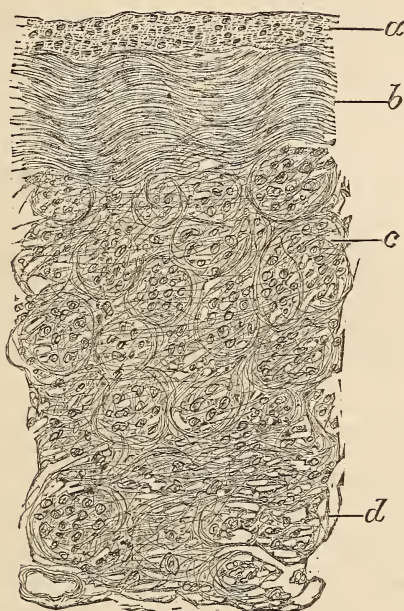


Section through mid-zone under low power, showing relations of the layers. *a*, mucous membrane with two of the nodular projections, *b*, *b'*; *c*, remnants of tubules; *d*, muscularis mucosæ, fibres cut longitudinally; *e*, muscularis mucosæ, fibres cut transversely; *f*, submucosa; *g*, inner, *h*, outer layers of muscular coat. Low power. Ocular A. Obj. one and one-half inches.

band above mentioned. The submucosa (Fig. 1, *f*) presents coarse fibre cells and is loosely connected to the muscular coat. The bloodvessels are numerous and large and the walls of the arteries are much thickened. The muscular layers (Fig. 1, *g* and *h*) appear normal. The muscle cells do not look so large, nor are they as well stained or well defined as those in the muscularis mucosæ.

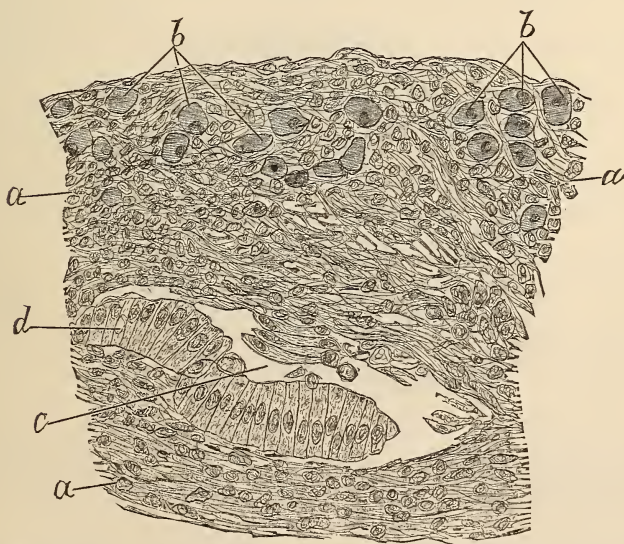
(2) Portion of the middle zone of the stomach in which are the nodular projections. The sections, which are from three to four millimetres in thickness, present essentially the same features as those from the fundus, but the small projections offer special features of interest. They are in reality remnants, or islets, of mucous membrane left in the general atrophy, and in them can be seen fragments of gland tissue. Even on inspection of the fresh organ with a low-power lens this seemed apparent,

FIG. 2.



Section of mucosa of fundus *a*, remnants of glandular layer; *b*, inner band of muscularis mucosæ, fibres cut longitudinally; *c*, outer layer of muscularis mucosæ, fibres cut transversely and arranged in bundles; *d*, beginning of submucosa Ocular A Obj. one-fifth inch.

FIG. 3.

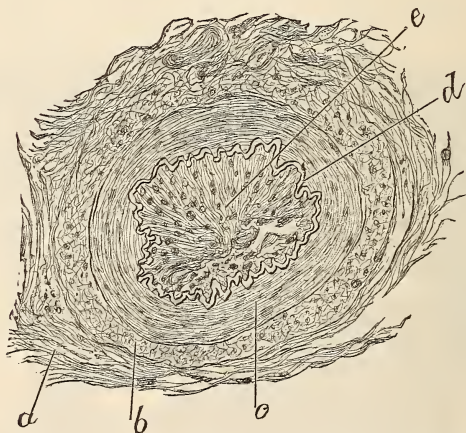


Portion of one of the nodular projections of mucosa, under high power. Ocular A. Obj No. 8. *a*, the small-celled infiltration; *b*, large spheroidal cells with eccentric nuclei, the remnants of the peptic cells; *c*, portion of a tubule with cylindrical epithelium; at *d*, the cells were displaced.

for in these portions and nowhere else could the orifices of tubules be seen. These portions are flattened, mushroom or pear-shaped, pyramidal or even pedunculated. Three tissue elements can be seen in them: (1) a basis or matrix of small round cells (Fig. 3, *a*) which stain deeply and give a very pronounced color to these parts; (2) large rounded epithelioid cells with eccentric nuclei, resembling, though somewhat larger than the normal gland cells of the peptic tubules (Fig. 3, *b, b*); (3) remnants of the tubules (Fig. 3, *d*), chiefly of the uppermost portions, with columnar epithelium. In many sections these tubules are represented as empty spaces (Fig. 1, *c*) from which the cells have fallen, in others they are still present. A normal-looking tubule was not seen, only portions; in places cystic dilatation seems to have occurred. At the base of the projections the small-celled infiltration is very dense and abuts directly in the longitudinally cut band of fibres of the muscularis mucosæ. Between two of these nodules, the mucosa has the appearance described in section 1.

(3) Flattened elevations in the pyloric region 5 or 6 centimetres from the ring, which were 5 or 6 millimetres in diameter, and stood out distinctly surrounded by areas of pale gray mucosa. With the low-power lens the orifices of peptic tubules can be plainly seen. On section, the columnar epithelium of the surface is seen in a few places. The tubules are distinct, particularly in the central portion of the patches, but the amount of small-celled intertubular growth is very great, and toward the margins it becomes the preponderating tissue, and a peptic tubule is only here and there noticeable. The cells of the tubules look normal in the central portion of these elevations, but toward the periphery they can be seen in all stages of atrophic degeneration.

FIG. 4.



Section of a small artery in submucosa. *a*, stroma; *b*, adventitia; *c*, muscularis; *d*, elastic lamina of intima; *e*, proliferation of subendothelial connective tissue, resulting in almost complete obliteration of the lumen of the vessel.

(4) Portion from the neighborhood of the pylorus. Thickness of section nearly six millimetres. Epithelium not apparent on the surfaces.



The tubules are numerous and large, with normal-looking epithelium. There are groups of closely set glands, but in most places the tubules are separated by the small-cell infiltration, which in certain regions, corresponding doubtless to the interspaces between the mammillations, occupies the entire thickness. Small cysts also occur in this region. The muscularis mucosa is thicker here than in the sections described under (3).

The arteries in the submucosa presented thickened walls, particularly the muscular coat, and in almost every section vessels could be seen in process of obliteration by subintimal proliferation, as represented in Fig. 4.

Bits of the fresh mucosa from various parts were teased carefully in salt solution. Except in the pyloric zone, no tubules or cylindrical epithelium were found. In some of the nodular projections remnants of gland tissue and a few columnar cells were seen. Gentle scrapings of the surface and the teased bits show a large number of flattened cells, unlike anything met with in the normal mucosa. They are irregular in shape, longer than broad, with granular protoplasm and central nuclei. The average measurements of a number gave  $\frac{1}{1280}$  to  $\frac{1}{853}$  of an inch in length, and  $\frac{1}{2560}$  to  $\frac{1}{1280}$  of an inch in breadth. Some of these are remarkably long; measurements of four gave  $\frac{1}{233}$ ,  $\frac{1}{220}$ ,  $\frac{1}{84}$ , and  $\frac{1}{56}$  of an inch, and from  $\frac{1}{800}$  to  $\frac{1}{1000}$  of an inch in breadth. Many of the cells, particularly in the pyloric region, look like swollen glandular epithelium of the peptic follicles. Flat ribbon-like muscle cells are numerous in all the portions examined, and there is a distinct fibrous stroma thickly beset with cells. Throughout this there are in places groups of rounded, translucent bodies, resembling the amyloid corpuscles met with in degenerating tissues.

Sections of the *duodenum* show many normal-looking tubules, but here, too, the amount of intertubular tissue seems excessive. Brunner's glands look healthy.

Unfortunately, by an oversight, portions of the jejunum and ileum were not reserved for examination.

*Pancreas.* Cells of the acini very granular, but otherwise normal; in places there are dark brown pigment grains. The interacinous connective tissue is slightly increased.

*Heart muscle* very fatty, but the degeneration is unequally distributed, as is evident, indeed, macroscopically. The brown pigment granules are very abundant in many fibres.

*Liver.* Cells distinct, moderately fatty. Small brown-red pigment grains very abundant both in the gland cells and in the connective tissue elements.

*Kidneys.* Epithelium of cortical portions swollen, and in places very fatty. The reddish pigment granules are very numerous, both in the convoluted tubes and in the epithelium of the loops of Henle, and in some of the collecting tubules.

The *bone marrow* presents the usual constituents of this tissue. There is very little fat; the marrow cells of various sizes make up the chief part, but the ordinary red corpuscles are abundant, and many of them are very large (megaloocytes). Nucleated red corpuscles occur in numbers. There is no essential difference between the marrow of rib, sternum, and tibia, except that in the last-named bone the cancellæ at the end contained fat.



Sections of the *semilunar ganglia* show deeply pigmented nerve cells and an excess of connective tissue.

**SUMMARY.**—*Clinical.* History of drinking habits for many years. Ten years ago severe gastric symptoms with great loss of flesh. For more than nine months severe symptoms of anæmia, with nausea, occasional diarrhœa, and irregular fever. Corpuscles greatly reduced, sinking to 315,000 per cubic millimetre. Transfusion; death.

*Anatomical.* Extreme anæmia, with the usual fatty changes in the organs and hyperplasia of the marrow of long bones. Atrophy of mucous membrane of the stomach, with complete destruction of the secretory tubules in the larger part of the organ. Hypertrophy of the *muscularis mucosæ*.

**REMARKS.**—The patient with the foregoing clinical history presented a vivid picture of progressive pernicious anæmia. Every symptom was present in bold relief: the excessive pallor and prostration, the anæmic fever, the retinal hemorrhages, and, above all, the extreme reduction in the number of the red globules, with, at the same time, a normal *proportion* of hæmoglobin, the alterations in the size and shape of the globules (poikilocytosis), and the presence of microcytes in abnormal amount. The most prominent symptoms were those of profound gastric disturbance, due to the prolonged abuse of alcohol, and the rapid diminution of weight. In less than one year the patient lost more than one hundred and fifty pounds. This is by no means the first case of pernicious anæmia to which gastric disorder stands in causative relation. Similar cases have been reported by Fenwick,<sup>1</sup> Quincke,<sup>2</sup> and Nothnagel,<sup>3</sup> through which a bright light has been thrown upon the pathology of this hitherto obscure disease, and it is for this reason that exception is now taken to the indiscriminate application of the term “idiopathic” to cases of progressive pernicious anæmia. The rapid loss of flesh may be regarded from another point of view than that of symptomatology. It is a well-attested fact that fevers, inflammatory and essential, are of more serious import in fleshy, so-called plethoric individuals, than in those of sparer habit, and, in explanation, von Recklinghausen<sup>4</sup> suggests that the rapid absorption of fat and the products of fatty metamorphosis may give rise to a qualitative change in the composition of the blood.

The conservation of the muscular strength is also worthy of notice in this and other cases. On August 15 the patient walked two miles without fatigue, when there were less than 2,000,000 red globules per cubic millimetre. A patient of Laache, of Christiania, walked three kilometres (more than two miles), the entire distance being *up hill*, when his blood contained less than 1,000,000 globules per cubic millimetre.<sup>5</sup>

<sup>1</sup> Atrophy of the Stomach, 18°1.

<sup>3</sup> Deutsches Archiv für klin. Med., Bd. xxiv.

<sup>5</sup> Die Anämie, S. Laache, Christiania, 1883, p. 147.

<sup>2</sup> Volkmann's Sammlung Klin. Vorträge.

<sup>4</sup> Deutsche Chirurgie, 1883, Bd. i. p. 180.

Such facts acquire additional significance when taken in connection with the deep red color of the muscles in these cases. It would appear that the muscles in pernicious anæmia are nourished at the expense of the other tissues.

All attempts at treatment in this case were rendered nugatory by the irritable state of the intestinal tract and by the patient's wilfulness and perversity in regard to matters of diet. Leaving out the blood examinations, in which he always took a keen interest, it was impossible to secure his coöperation in any diagnostic or therapeutic procedure. Although repeatedly requested to save the urine secreted during the whole twenty-four hours, in order that its percentage of urea might be estimated, he only managed to do so once. On this occasion (June 26) the amount was 45 oz.; sp. gr., 1.012; percentage of urea, 2.05 (normal). There was no albumen.

The only special lesion in the case was the atrophy of the mucous membrane of the stomach. This was evident to the naked eye in the thin, cuticular appearance, and was abundantly confirmed by the microscopical examination, which showed that the peptic glands had been destroyed over the greater portion of the organ. The numerous small elevations which existed in the middle zone, represented areas of the mucosa less advanced in degeneration, and are comparable to the nodules of relatively normal tissue which beset the surface of a cirrhotic liver. Toward the pylorus, where the atrophy was less advanced, the various stages of the process could be traced, consisting essentially in a small-celled infiltration between the tubules, such as occurs in all forms of slow interstitial inflammation; and we may reasonably conclude that this process, extending over many years, ultimately led to the condition here described. The only other alternative is the supposition that a creeping ulceration had at one time involved the greater part of the mucosa, with the exception of the little islets of tissue already mentioned, and in healing had left the membrane in this state. The radiating cicatrix at the lesser curvature no doubt indicates that the patient had had, at one time, probably in 1877, when the gastric symptoms were so marked, an ulcer in this region, but the uniform, smooth appearance of the membrane, the absence of puckering, and the condition of the muscularis mucosæ, are not consistent with the view that there had been extensive ulcerative destruction, such as in rare cases does involve the stomach. In these instances, the process is not confined solely to the layer of tubules, but involves the muscularis mucosæ, which is infiltrated with round cells, and in healing the mucosa and submucosa are closely united to each other. Except at the site of the cicatrix, the mucous membrane was in this case freely movable on the muscular coat. The remarkable hypertrophy of the muscularis mucosæ is an associated condition not easy of explanation, but we call to mind in this connection the increase

in the unstripped muscle elements in other conditions associated with irritation or degeneration, as notably in the lung of the cat affected with the nematoid parasite *Ollulanus*; and in the bronchial tubes of man in some cases of chronic bronchitis.

The recorded cases of atrophy of the stomach with clinical features of pernicious anæmia are not very numerous. Fenwick<sup>1</sup> describes four cases, Quincke<sup>2</sup> one, Nolen<sup>3</sup> two, and Brabazon<sup>4</sup> one; and in all of these the mucous membrane was affected without special alteration in the thickness of the walls of the stomach, or any diminution in its capacity. Nothnagel's case was one of cirrhotic contraction of the stomach and atrophy of the peptic glands, with the clinical features of pernicious anæmia. In some of these cases the histological examination was very defective, and the exact condition remains doubtful. In Fenwick's cases the interstitial connective tissue was greatly increased, and the gland tubules atrophic, but there was not the extensive destruction of the glandular layer which was so marked a feature in our case. The histological account in Nothnagel's case, by W. Müller, makes it clear that there was complete atrophy of the tubules in the entire organ, with the exception of the pyloric region. There was great thickening also of the *muscularis mucosæ*.

It seems natural to conclude that in the case we have described, the abuse of alcohol, extending over many years, played a part in the causation of the atrophy. Certainly he had chronic dyspepsia, and had suffered from a gastric ulcer; but while these not uncommon conditions may lead to moderate wasting of the mucous membrane, such extensive destruction of tubules is rarely seen. In the cases narrated by Fenwick there was no history of alcoholism. In connection with the extensive endarteritis of the smaller gastric vessels, and the existence of scars on the glans penis and in the groins, the possibility of a syphilitic process may be considered, but we know as yet very little of the influence of syphilis on the stomach, and the recent attempt of Gaillard<sup>5</sup> to connect certain forms of gastritis with this disease cannot be regarded as in any way successful. It is quite possible, however, that the state of the small arteries may have had something to do with the production of the atrophy. We have learned of late years to connect indurative processes in other organs with arterio-sclerosis and the endarteritis of the nutritive vessels of the mucosa may really have played an important part in inducing the wasting. In a recent review of this subject, Martin<sup>6</sup> suggests that certain lesions of the mucosa may be due to these end-arterial changes, but acknowledges that, with regard to the stomach, the facts are as yet too few to warrant any conclusions.

<sup>1</sup> Loc. cit.<sup>2</sup> Loc. cit.<sup>3</sup> Centralblatt f. d. med. Wissenschaften, Bd. xx.<sup>4</sup> Brit. Med. Journal, 1878, ii.<sup>5</sup> Archives Générales, January, 1886.<sup>6</sup> Revue de Médecine, January, 1886.



To the other anatomical features of the case we do not propose to refer. The reader will doubtless have noted the identity of the conditions with those in pernicious anæmia, even to the hyperplasia of the bone marrow and the pigmentation of the cells in the organs. One point, however, is worthy of note, viz., the large size and healthy appearance of the pancreas. This organ varies greatly in size, but we regard it as certainly hypertrophied in this case, and we may see here possibly a compensatory effort to supply the defects in gastric digestion.

A careful study of this case justifies, we believe, the conclusion that a primary atrophy of the mucous membrane of the stomach does occur; and it further bears out the original suggestion of Flint, confirmed by Fenwick, Nothnagel, and others, that certain of the cases of progressive pernicious anæmia depend upon profound alterations in the gastric tubules.

For the sections and drawings we are indebted to the skill of Dr. J. P. Crozier Griffith.

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## REPORT OF A CASE OF MULTIPLE MYOMATA OF THE SKIN, ACCOMPANIED BY SEVERE PAIN; WITH REMARKS.<sup>1</sup>

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THE following case, of which I shall present brief notes, together with a plaster cast showing the size and general arrangement of the growths, is, I think, worthy of record as a contribution to the study of painful tumors of the skin:

J. B., German, aged thirty-six years; he is married and has two healthy children; his wife is also healthy. His family history is good, and he does not recall that either of his parents ever suffered from any cutaneous disease. He has never had syphilis.

So far as his knowledge goes, his present trouble began about one year ago. He observed that when the weather changed—that is, became either hot or cold—he experienced a drawing pain, lasting about five minutes, in the place where the lesions are now situated. When the pain subsided he was unaware of anything abnormal in this situation. These pains were absent sometimes for two or three weeks, sometimes a day, sometimes three or four days. To relieve these paroxysms he would make firm pressure over the affected region. At this time, however, he does not remember that, between the paroxysms, any pain was evoked by either accidental or intentional pressure. Later on, but he cannot say when, he was aware of the presence of a few lesions, and from time to

<sup>1</sup> Read before the American Dermatological Association, August 27, 1885.



time thereafter he was conscious that others became developed. He is quite positive that for the last six months the patch has existed pretty much in its present shape, and has not further progressed.

Of course, all of these statements must be taken with due allowance, and we can only be tolerably certain as to the length of time during which the subjective symptoms have been present; the tumors themselves may have been established long before his attention was attracted to them, especially as they are situated on the back, out of the field of vision.

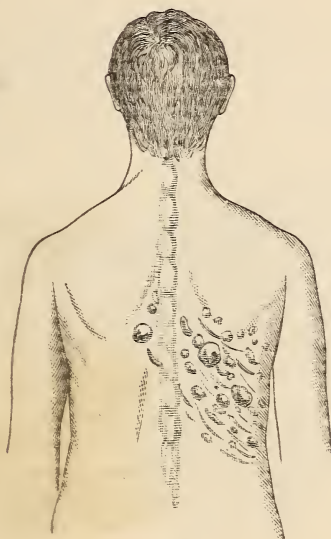
**PRESENT CONDITION.**—The patient is a strong, hearty man, five feet ten inches in height, and, according to his own account, has never been sick. He is a peddler by occupation, and is constantly exposed to all the vicissitudes of weather. The neuralgic pains referred to above still persist. They come on mostly at night, when in bed. The intervals between the attacks are subject to considerable variations. At one time he will suffer nocturnal visitations for six or more nights together; then he will escape for two successive nights, or even for a week altogether. Of late, they have been more frequent and more severe. He is inclined to regard changes in the weather as largely responsible for his sufferings. The paroxysms appear suddenly and without premonition of any sort. Each attack lasts from two to three minutes, but is not repeated the same night. When a paroxysm occurs, the patient says that he feels as though he were being crushed together, and he rolls and tosses about in his bed in great agony. To gain relief, he turns on the affected side and instinctively makes deep, strong pressure with his hands. So far as he can judge, the pain is absolutely confined to the region of the growths, and does not radiate.

Examination made in the intervals of the attack shows that the parts are not at all hyperæsthetic, superficial touch with the fingers producing no symptoms of any kind; but moderately deep direct pressure with the tip of the index finger will cause him to drop to the floor, moaning with agony. In this case the pain appears to be but momentary, and is entirely different in character from the vice-like pressure of the spontaneous attacks. While pressure made almost anywhere over the affected region will cause the patient to wince, the acute pain follows only upon pressure over the larger tubercles. I do not now recall that there was any change in the color of the region involved during a paroxysm, or that there was any difference in the temperature or the occurrence of quiverings or contractions in the parts; but I must confess that, as my attention was not particularly called to these points at the time, they may have been overlooked.

**DESCRIPTION OF THE LESIONS.**—The infiltrated patch or plaque is situated on the right side of the back, in the mid-dorsal region, Fig. 1. It commences at the spinal column and takes an oblique downward course. It is four and a half inches long by two and a half inches wide. It passes over to the left side of the spine by two small tubercles. The great bulk is to the right of the column. The patch is made up of an aggregation of variously sized growths and infiltrations. Some of them are round and decidedly elevated above the level of the skin, at least three being as large as hazelnuts; others are elevated a few lines only and spindle shaped, or else dispersed in lines and streaks. The growth seems to involve the substance of the skin only, and is not bound down to the subcutaneous structures. The overlying epidermis is not scaly, or

otherwise appreciably abnormal. The patch is of a reddish color, and the large tumors do not look unlike flesh moles. None of the growths are pedunculated.

FIG. 1.



Infiltrated patch.

Some time after he first came under observation, I passed a weak galvanic current through the tuberculated region, and whether as a result of the treatment, or from a mere coincidence, the patient thought that the intervals between the paroxysms had been extended. However, he appeared to suffer as much as ever when firm pressure was made over the larger tubercles.

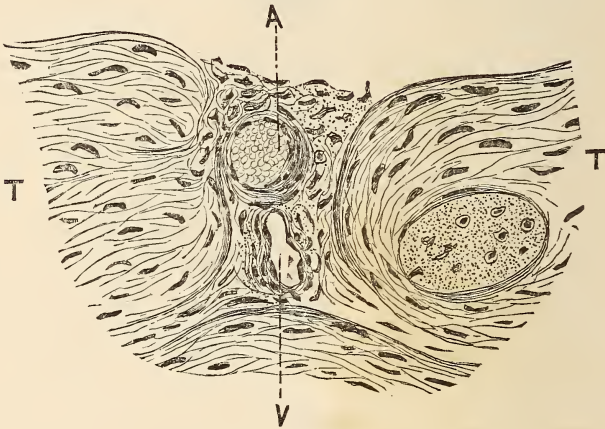
At my request, his physician, Dr. H. Tuholshe, cut out one of the large growths for microscopical examination. The tumor seemed to be encapsulated in the skin. Dr. L. Bremer, of St. Louis, to whom the specimen was submitted, made the following report of his microscopical investigations: "The tumor is about the size and shape of a large split pea; it is hardened in alcohol. Vertical sections, unstained, show moderately hypertrophied papillæ in some places, a comparatively thin layer of derma, and beneath this an apparently smooth mass when examined with a low power. Sections treated with picrocarmine show the usual reactions of the epidermis, an intensely red color of the derma, and a straw-colored mass beneath it. Prolongations from the derma, all characterized by their red color, traverse the former as narrow bands in all directions. The straw-color of picrocarmine staining indicates that the tissue lying beneath the red mass is composed of smooth muscle fibre. I had no saffronine at my disposal to verify and corroborate the result obtained by the picrocarmine test.

"With a view of establishing the presumed presence of nerve fibres in the new growth, osmic acid and chloride of gold were used; both these reagents yielded negative results. Neither myelinic nor amyelinic nerve

fibres could be demonstrated. No new formation of nerves could be ascertained.

"On staining the sections with hæmatoxylin, rod-shaped nuclei appeared in great numbers, coming in different directions, showing the characteristics of the nuclei of smooth muscle fibres. They varied in length, some of them being three times as long as an ordinary nucleus of the smooth muscle fibre; there were also a few spindle-shaped nuclei.

FIG. 2.



Proliferation of the muscular elements of an artery (A) and a vein (V). TT, tumor. Hæmatoxylin and eosine. Hartnack, 3, vii.

In the course of the septa furnished by the bands emanating from the derma, arteries and veins could be seen in a state of proliferation of their muscular elements. The same could be observed to a still greater extent in the derma. No normal artery or vein was to be seen in the latter. There was not, however, any appreciable round-cell infiltration around the vessels, such as is seen in inflammatory processes. It is probable that some of these strings of nuclei represented cutaneous nerves. No normal cutaneous nerve could be made out.

"The tumor, in my opinion, is a conglomerate of interlacing bundles of smooth muscular fibres. These bundles are formed by the proliferation of the muscular elements of the arteries and veins of the original derma, Fig. 2. There seems to be a limit of this process at the point where the veins and arteries lose their muscular layer and pass into capillaries. This would account for the stationary, non-progressive character of the tumor, as demonstrated by the clinical history of the case.

"In the fully developed tissue of the growth, I never observed the process of division in the rod-shaped nuclei, whereas I could see it in the immediate neighborhood of the proliferating vessels. The gradual transition from the muscular elements of the vessels into tissue tumor could be seen in a satisfactory manner in a number of specimens stained with hæmatoxylin and eosine, Fig. 3.



"I do not claim this report to be exhaustive, on account of the small amount of material obtainable: only one tumor was examined."

FIG. 3.



Proliferating bloodvessels and their relation to the tumor and the derma. V V V, vessels in a state of proliferation. T T T, lobes of the tumor. Hæmatoxylin and eosine. Hartnack, 3, iv.

REMARKS.—Looked at from a purely clinical standpoint, it will be seen that the case just reported bears a strikingly close resemblance to the cases recorded by Duhring<sup>1</sup> and Kosinski,<sup>2</sup> which were looked upon by the authors mentioned as instances of pure neuroma of the skin. In all three cases we find certain characteristic features that they have in common, viz., the presence of numerous tubercles more or less embedded in the skin itself, and giving rise to unusually severe pains as a result of pressure or else of a spontaneous character. While in Duhring's case they occupied no nerve tract, in Kosinski's patient and my own this connection seems obvious. Whether the tumors in my case bore some relation to the cutaneous distribution of the dorsal nerves, I cannot say; at any rate, the presence of nerve tissue in the tumor examined was not demonstrated.

Looking further in this direction, we discover that in the muscle tumors of the skin reported by Besnier<sup>3</sup> and Solles,<sup>4</sup> the growths were painful in the first observer's patient as the result of pressure only, but in the patient of the latter the tumors were the seat of pain, both spontaneous and when provoked by traumatism of various kinds, and which,

<sup>1</sup> AMERICAN JOURNAL OF THE MEDICAL SCIENCES, Oct. 1873, and Oct. 1881.

<sup>2</sup> Centralblatt f. Chirurgie, No. 16, 1874.

<sup>3</sup> Annales de Derm. et de Syph., 2me Sér. t. i. No. 1, 1880.

<sup>4</sup> Ibid., 2me Sér., t. ii. No. 1, p. 60.



at first confined to the part irritated, afterward radiated in all directions. Wood's cases of subcutaneous painful tubercle, which were probably examples of fibromata and fibro-neuromata, also presented symptoms which differed little from those just described, as will be seen from the following synopsis of his original communication:<sup>1</sup>

The tumors were generally single and subcutaneous, although in some instances multiple, and in one instance so superficially seated as to form a visible prominence. The pain was extremely acute in the lesion itself, but it also radiated. The pain could be provoked by pressure, and also occurred in violent paroxysms. During a paroxysm the suffering was slight at first, but rapidly increased until it became excruciating. It went off gradually, leaving the parts sore to the touch. The paroxysms lasted from ten minutes to two hours, and increased in severity with the age of the disease. Some had ease for days, or even weeks; others would have several attacks in one day. The pain was generally spontaneous, but could also be aroused by friction, etc. The attacks usually came on in the night, the patient waking in frightful agony. Handling the parts caused no pain, except during a paroxysm, when the affected region became acutely sensitive. Acute pain was produced at all times by changes in the weather. Some patients stated that they were sensible of an increase in size in the tumor and a change in color during an attack.

Most of his patients were females. Wood credited Cheselden with having first called attention to these painful tubercles. It is a significant fact, that in all of these cases, whether classed as fibromata, neuromata, or myomata, the subjective symptoms are nearly identical.

I shall leave entirely to the consideration of pathologists the various interesting histological questions that arise in this connection; as, for example, whether there exist true neuromata in the sense of tumors composed of newly formed nerve fibres; the connection between fibroma and neuroma; what causal relation, if any, exists between these variously constituted growths and the nervous system, etc.; but, as a clinician, I believe that the following conclusions, arising from a consideration of the points mentioned above, are to a degree justified:

That certain new growths in the skin and subcutaneous tissues, accompanied by severe pain, both of a spontaneous character, and as produced by direct irritation, may be of widely different histological structure; and that, therefore, from a clinical standpoint, we are not justified in assuming that a painful tumor or tubercle is a neuroma (fibro-neuroma) from the subjective symptoms that it presents, or from the macroscopic character of the lesions.

<sup>1</sup> Edin. Med. and Surg. Journ., July, 1812.

PARTIAL, AND SOMETIMES GENERAL, CHOREA MINOR  
FROM NASOPHARYNGEAL REFLEX.

BY A. JACOBI, M.D.,

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THE boundary lines between the normal and abnormal functions of the peripheral nerves are frequently but indistinct; thus it is that now and then morbid conditions are overlooked or underestimated. Changes of that kind are often tolerated with the expectation that the trouble will pass by, that the patient will outgrow it; and the period of the second dentition, or of menstruation, is held out as the future anchor ground for restored health. Many of these deviations are reputed to be but bad habits, for which admonition, punishment, and patience are put into requisition. But bad habits are just as well the results of physical changes in the structure of the nerve centres or their outlying provinces, as morbid changes in the functions of the coarser viscera spring from their anatomical alterations.

For many years my attention has been drawn to some of these apparent habits which I soon recognized as actual diseases. The cases were so numerous after they had become familiar to me, that they soon lost the mark of novelty, and after I had once failed to speak of them except in clinical lectures, I looked upon them, because of their frequency, as daily occurrences and likely to be familiar objects in the practice of every physician. Thus I have never mentioned the subject in any assembly of my colleagues until recently, and was surprised to find that what I considered trite, was still worth mentioning before a learned public.

I allude to a number of convulsive muscular movements of the face and the upper portions of the trunk. Children of three years and upward, up to the ages of puberty and even adult life, are given to blepharospastic winking with the eyelids, in rare cases with but one of them; momentary and frequent frowning, both horizontal and vertical; twitching of one or both angles of the mouth, and of one or both halves of the face; drawing up and wrinkling of the muscles of the nose; shrugging of a shoulder or both, now and then complicated with a violent, semi-convulsive twitching and tossing of an arm. These anomalous muscular actions persist for years, indefinitely; mild cases, however, I have often seen improve spontaneously during the summer months, and get worse during winter.

These abnormal actions are but rarely confined to a single muscle, even in mild cases two or more of the contractions I have mentioned are found together. In adults only, I have met with a few cases of

partial twitching confined to a single cheek, exactly like the genuine *tie convulsif*. Now and then this clonic local spasm belongs to the same category, and is attributable to the same cause which is the subject of these remarks. Occasionally the local clonic contractions will lead to more severe complications. The muscular irregularities extend to the diaphragm, and over the whole body, and a genuine chorea minor is the result. This generalized chorea, when originating in this manner, is very much more liable to persist than the, perhaps, more severe cases we are familiar with as the results of articular or cardiac rheumatism, of spinal anæmia, or even of cerebral embolism. Unless their cause be recognized, I have seen them lasting through quarters and halves of, or even whole years, getting somewhat better occasionally, particularly in the warm season and good weather, but liable to return any moment. The large majority of patients of this class are children.

Beside the muscular anomalies mentioned, there are some others which draw our attention to the primary cause of the disorder. There is frequent snuffing up, snuffing out, a hawking, a short hacking cough which often is recognized as the result of a voluntary effort. The examination of the fauces reveals congestion of the whole surface, swelled muciparous glands, large tonsils with or without the results of previous inflammations or suppurations. They need not always be congested; such as have suffered most are even apt to be unusually *pale from the presence of compressing cicatricial tissue*. The pharyngeal congestion is observed to ascend in the direction of the posterior nares. The inspection of the nose reveals a congested and swelled mucous membrane, and the thickening and hyperæmia of the cavernous tissue particularly of the lower concha, which is justly claimed as the principal lesion occasioning many instances of spasmodic asthma or neuralgic affections of the trifacial nerve. The nostrils, or one of them, are always rather narrow, the septum frequently deviated, slight admixture of blood with the nasal mucus is sometimes noticed; now and then the cheeks and upper lip are puffed with chronic œdema, the so-called scrofulous face, and not infrequently the lymphatic glands of the neck, near and in front of the angle of the lower jaw, are swelled. Nasal catarrh is reported as frequent; many of the patients have been life-long snorers. Otherwise nothing appears to be abnormal, with the exception of those cases in which the persistent hyperæmic swelling and nutritive disorder had given rise to hyperplastic thickening. In many of these cases part of the surface is anæmic, dry, and rather hard. Nervous disorders of any kind but those described have not been observed; in fact, most of the children seen by me did not exhibit any universal neurotic expression or tendency.

Thus there is not necessarily a direct connection between these irregular choreic symptoms of local origin and general neurosis, at least the



former do not depend upon the latter. If general nervosism were the cause, its effects would be apt to be general. For the local effect there is a local cause; even in the usual form of generalized chorea the involuntary spasmodic reflex movements are occasioned by local irritation. Thus it is that the quietude of sleep does away with choreic movements, but again semi-voluntary movements during a dream are liable to produce choreic irregularities even during sleep. The local cause of the local or partial chorea I have described, is found in the abnormal condition of the nasal and pharyngeal mucous membrane with its influence on the terminal sensitive ends of the trifacial nerve. It is to be assumed that the motor branches and terminal ends of the same nerve are first affected, and before any other nerves participate in the reflex symptoms.

These motor branches of the trifacial supply the masticatory muscles, the temporal, masseter, and pterygoid, the tensor of the velum palatinum, the mylohyoid, and the anterior belly of the digastric muscle (also the tensor tympani). It is these muscles which are brought into abnormal play in the symptoms described before. After some time only, the trapezius, the muscles of the upper extremities, and finally the rest of the body, participate in the display of irregular movements.

The sensitive and vasomotor reflex symptoms, mainly hemicrania and asthma, subsequent to the subacute and chronic swelling of the nasopharyngeal cavity, and particularly the loose cavernous cellular tissue of the inferior concha, are well known by this time to everybody. The results of the studies and therapeutic measures of Voltolini, Haenisch, Sommerbrodt, and particularly Hack, whose last lucid and modest *exposé* in the proceedings of the German Congress of Internal Medicine is but nine months old, have added greatly to our knowledge, and the relief of the suffering. It is, however, not my object to repeat what most of us have read and practised by this time. Why I allude to their labors, has, however, its good reasons. Their observations are supplemented by mine. Theirs belong to the sensitive and vasomotor nerves, mine to the motor. Their observations have, moreover, the priority of publication. Mine date, in their large majority, from a period antedating by many years their published records. I make this statement in order to impress it upon the minds of my readers that I do not rely upon a few cases, but that in the course of many years I have seen so large a number that I feel confident there will be no lack of similar cases in practice, as soon as the attention of practitioners has once been drawn to their existence.

There is another reason why I allude to Hack's last exposition. As a reaction from his former enthusiasm over exaggerated results, he appears now to be a little doubtful about the importance of some local changes in regard to producing reflex symptoms. Hyperplasia and polypi are, according to him, no longer causes of reflex symptoms. On the contrary,



according to him, they are liable to impede reflex, and when the latter does exist it is asserted to be present in spite, not in consequence, of hyperplasia and polypi. This I believe to be a mistake. I have no doubt, whatsoever, that many of my cases of muscular reflex were the result of irritation of nerve filaments embedded in hyperplastic and cicatricial tissue. The irritation of peripheral nerves in neuromata, and in cutaneous cicatrices, are the very best proofs of what a pinched nerve branch can get up in the way of suffering.

Nor has it appeared to me as if our knowledge of these matters, both as to cause and effect, was nearly complete. It is true, the description of the nose and pharynx as given by these authors, and that of the neuralgic and spasmodic reflex symptoms related by them, is both accurate and conclusive. But in both their symptomatological and anatomical teaching, something appears to be wanting. This want is perhaps the cause of the fact, that the therapeutical results leave much to be desired, as Hack is very anxious to state. In addition to that, insufficiency of the anatomical descriptions is particularly evident, when we take into account the more modern researches of G. L. Tornwaldt ("On the bursa pharyngea in its relation to the diagnosis and treatment of certain diseases of the nasopharyngeal space," 1885), and of F. Trautmann ("Anatomical, pathological, and clinical studies on hyperplasia of the pharyngeal tonsil," 1886). I speak of both because of the relative novelty of the subject of nasopharyngeal reflexes, and of the difficulty of the anatomy of those parts which, though the rhinologists and rhinoscopists assure us that the diagnosis of these affections is rendered play-work with the aid of their modern instruments, mirrors, hooks and lights, exist nevertheless.

Tornwaldt says that the entrance of the bursa pharyngea can be seen with the aid of hook and rhinoscope almost in every person. It is a groove, or an aperture—funnel-shaped, spherical, or oval—in the median line of the roof of the fauces, in about the centre of the distance between the upper margin of the posterior nares and the protuberance of the atlas. The bursa itself has more frequently the shape of a sac or a blind canal than of a groove; as its aperture is mostly narrow, the bursa is a frequent starting-point of nasopharyngeal diseases. The affections of the bursa proper are of two kinds, first, hypersecretion in consequence of a catarrh spreading from the neighborhood, which is very apt to prove permanent though the original neighboring catarrh may have disappeared; and, second, cystic degeneration by obstruction of its outlet.

In persistent catarrh of the bursa the flow of liquid mucus, or the deposit of viscid mucus can be recognized in the midst of, or below a relatively healthy mucous membrane. The cyst is a tumor of a transparent yellow color. In some cases, however, it can be diagnosticated only by the

absence of the aperture, the presence of cicatricial marks, and the absence of secretion in the midst of a congested and secreting neighborhood. An incision gives vent to the discharge of the liquid or pultaceous contents. The symptoms of both hypersecretion and cystic degeneration of the bursa are rather identical with those of nasopharyngeal catarrh. Of accompanying symptoms belonging to other organs the author mentions hyperæmia, hyperplasia, perhaps also polypi of the nasal mucous membrane, diseases of the ear, pharyngitis granulosa, chronic laryngeal catarrh mainly of the intra-arytenoid portion, bronchial and chronic gastric catarrh, cough resulting from the direct irritation by the descending secretion, and reflex cough not attended with perceptible laryngeal or pulmonary disease, bronchial asthma, and pain about the manubrium sterni, occiput, neck, or forehead. The duration of the diseases of the bursa is rather indefinite; they persist unless the bursa is restored or destroyed.

The pharyngeal tonsil which forms the subject of Trautmann's large monograph, is known to surgeons as one of the causes of retropharyngeal abscess. He, however, studies its pathology principally in its relation to the diseases of the surrounding territory, and to the reflex symptoms produced by it. Amongst these he refers particularly to cephalalgia of the temporal and frontal regions. He found it eighty-seven times in one hundred and fifty cases, and explains it by venous obstruction. It disappeared with the removal of the hyperplasia in every case except two. In one of these *vomiting* and *fainting* were observed once; there was a nasal polypus. *Tetany* twice in one hundred and fifty cases. Its explanation is as above, in the opinion of the author.

*Venous obstruction in the nasal conchæ* is absent in but a few cases. It is mostly developed in the lower concha, and mainly in its posterior part. The second concha is not swollen to the same degree. The color is grayish-red, or bluish-red. When the disease is of old standing, there is hyperplasia of the subepithelial connective tissue, and the surface of the concha is no longer smooth. It becomes granular, and redder than before. After the hyperplastic pharyngeal tonsil has been removed, venous congestion of the concha will disappear. But the hypertrophy of the subepithelial connective tissue requires surgical treatment. The sense of smell was never abolished, and in all cases in which it occurred (eighteen times in one hundred and fifty cases), epistaxis ceased after the operation.

Thus it follows that the examination in cases of both sensitive and vasomotor reflexes on one hand, and the muscular reflex symptoms referred to by me, is not so easy as it appeared to be. I think there is reason to believe that the majority of cases of hemicrania and asthma which were not relieved by Hack, and others, by the galvano-cauterization of the hyperæmic and swollen tissue of the inferior concha, were not

such as were caused by that affection, and that locality. The improved knowledge of the anatomy of the nasopharyngeal cavity will probably clear up the etiology of many a case which was not diagnosticated correctly, and both pharyngeal bursa and tonsil will come up for their share in both etiology and treatment.

There is another mistake which is very apt to lead to serious results. Nasopharyngeal catarrh is not a well-defined nosological entity. It is quite true that catarrh of the nose and pharynx, and also of the conjunctiva, are found together. This, however, every unprejudiced practitioner has found to be a fact, that one cannot be cured without the other, and that when one remains the others will relapse. Still another fact must not be overlooked. There is many a case of nasal catarrh with all its consequences, both local and reflex, which is but the continuation and result of a pharyngeal catarrh. It will get well only when the latter has been removed. Thus many a rhinitis has to be treated in the pharynx, and many a pharyngitis in the nose; and both may never get well unless the enlarged or abnormal tonsils have been removed, or resected. This is not only true of the large tonsillar masses closing in with each other, but also of those tonsils which, having been the seats of repeated inflammations and suppurations, have nothing left but cicatricial tissue, broken-down follicles, and ducts of one-quarter to one-half inch in length leading in every direction, with abnormal secretions undergoing decomposition and giving rise to constant local irritation.

## REVIEWS.

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A SYSTEM OF OBSTETRIC MEDICINE AND SURGERY, THEORETICAL AND CLINICAL. FOR THE STUDENT AND PRACTITIONER. By ROBERT BARNES, M.D., Obstetric Physician to St. George's Hospital, etc., and FANCOURT BARNES, M.D., Physician to the Royal Maternity Charity, etc. Illustrated with two hundred and thirty-one woodcuts. 8vo. pp. 884. London: Smith, Elder & Co. Philadelphia: Lea Brothers & Co., 1885.

THE stream of obstetrical literature continues in steady flow. The ambition of teachers, the enterprise of publishers, the desire for novelty, all concur in impelling the current, and volume succeeds volume with increasing rapidity. The one which we have now to submit to that criticism which, in the preface, seems to be challenged, bears a name which needs no introduction anywhere in the world. There is no more active worker in the profession than the elder Barnes. The excellence of his treatise upon *Diseases of Women* is everywhere acknowledged. Moreover, his work upon *Obstetrical Operations*, now before the profession since 1870, entered a new field in the teaching of this branch in our language. Going more fully into the application of mechanical principles to artificial delivery, copiously illustrated, the book was warmly welcomed by every student of the subject. Further, the author, in that work, showed himself capable of rising above insular prejudices, and improved the obstetric science of his country. By his adoption of the long forceps, and his energetic advocacy of their superiority, his teachings had a powerful influence in extending their use, and, in corresponding degree, in lessening that frequency of resort to the perforator, which will always remain a blot upon the history of British midwifery.

There are many influences, then, tending to insure a friendly reception to anything upon obstetrics from the pen of Robert Barnes. It would be very agreeable if we could say the same of the son. Unfortunately, there is a little matter relating to the publication by Fancourt Barnes of a German medical dictionary, which does not dispose the profession of this country kindly toward him. That this little volume, published as his, was boldly copied from one the production of an American physician,<sup>1</sup> is only too evident from the fact that the very errors of the one duly appear in the other; mistakes of orthography and of punctuation are so faithfully reproduced as to render a defence of the charge of plagiarism impossible. We think Fancourt Barnes's share in the production of this work very small indeed. In the preface it is stated that the portion on antiseptic midwifery and "the description of the operations" is his work. Some even of the former very brief por-

<sup>1</sup> Dictionary of German Terms used in Medicine. By George R. Cutler, M.D. New York: G. P. Putnam's Sons.



tion bears unmistakable marks of Robert Barnes's pen, while as to the operations, if the new ones are alluded to, it will soon be seen how singularly deficient the work is in regard to them. Fancourt Barnes owes, without doubt, the appearance of his name in the title-page rather to the partiality of the parent than to the amount of work performed by him.

However well disposed may be the feeling toward a favorable acceptance of any work bearing the name of the senior author, this book should still be critically examined in the interests of the science of which it treats. It enters the world of letters, and it should be judged by its merits. It is needless to say that the character of other books by the same pen presents no guarantee as to this one. Especially should the work be judged by the aim and objects of the author in its production. Dr. Barnes set out to present a "fairly complete treatise" on which the work treats, to produce "a hand-book of obstetric medicine and surgery for the use of the student and the practitioner," that is, a work which may serve as a manual for the one and a reference-book for the other. A careful examination of the volume in this light compels the record of a very great disappointment. It would not be possible for Dr. Barnes to give us less than a complete treatise, or one without evidence of marked ability. So this book is complete in the sense of containing something on all the subjects pertaining to obstetrics. In many respects it is able; we could point to some chapters of great excellence, and some portions which leave nothing to be desired. The volume might be truthfully dismissed with the stereotype phrase, that "it deserves a place in every library." Yet a critical examination reveals so many faults, so many points in which it is behind the times, so much of importance lacking, and so many doctrines to which we cannot assent, that a feeling stronger than surprise is experienced, and duty impels us to an examination of some of the more practical portions of the work, and to such a presentation of its leading characteristics as will suffice for the formation of a judgment by our readers.

That portion of the work relating to obstetrical operations needs but little attention, as it has been long before the profession as an independent volume. Meantime, however, there have been some notable additions to our instruments, and some very important modifications of operative procedures, and the author's judgment in regard to these will be looked for with as much interest as anything else in the book. First among instruments stands, of course, Tarnier's axis-traction forceps. The description of this instrument here given is extremely meagre, and unworthy so important an addition to our armamentarium. No one could get a good idea of Tarnier's forceps from the mere statement that "the perineal curve is provided with special traction-bars attached to the lower ends of the fenestræ." Nor do the illustrations make the matter clear. There are but two; in one the instrument is shown as applied, and thus partly within the pelvis; the other is a diagram of the direction of the force, as applied with this and with the ordinary instrument. The fact is, that Tarnier's instrument is not adopted or recommended, but Aveling's is preferred by the author. This instrument was presented to the Obstetrical Society of Great Britain in 1868, and is claimed to be the type of the modern axis-traction forceps. The handles are carried backward in a pronounced curve behind the perineum, so that the whole has a sigmoid shape. Traction at the end of these handles, it is claimed, is true axis-traction, and fulfils all the aims and intentions of Tarnier's

instrument. We fail to see it, and this mental blindness seems also to have affected the obstetrical world. Thousands will read of Aveling's forceps for the first time here, while Tarnier's is known everywhere. We fail to see how the traction force is applied by Aveling's instrument "as nearly as possible to the centre of the child's head;" and think that the index-needle principle of the handle of the Tarnier forceps deserves more attention than the curt dismissal given it by Dr. Barnes. "Upon the whole, we think the index-needle principle may be dispensed with."

But there is another point in regard to this forceps. It is claimed that "the great share in the invention of the modern type of axis-traction forceps must be awarded to Aveling." Now Dr. Barnes quotes frequently from the encyclopædic work of Charpentier,<sup>1</sup> and must, therefore, know of the forceps of Hubert, of Louvain, which were brought out in 1860, eight years before Aveling presented his. In this instrument the handles are bent backward at a right angle to admit of the same application of force as in Aveling's. It would be a mere quibble to claim that there is a material difference, because by Aveling the modification is a "sigmoid curve," and by Hubert it is an angle. The principle and the intended effect are identical, as plainly appears from the description and comments in Charpentier. Dr. Barnes, therefore, has gone out of his way to make a claim for his countryman which is not justified by the facts and which cannot be sustained.

We have no fault to find with the author for preferring the forceps of Aveling, but he should be just. Also, a recent work on obstetrics should contain a fuller and a clearer description of so important an addition to our resources as Tarnier's forceps. His opinion as to the influence of the instrument upon practice is important, and must be given. It bears upon the great question, turning *versus* forceps, and is favorable to the latter as against the former.

"We have arrived at the conclusion that generally the forceps is to be preferred; and that in those cases in which the feet have come first, either spontaneously, or after turning, still delivery of the after-coming head by the forceps is preferable to dragging the head through by the hands. The forceps should be tried first; and it is all-important to use the traction forceps. Having brought forth living children by this instrument from women who had lost children by turning or with ordinary forceps, we cannot doubt its superiority. The axis-traction forceps, thus extending the domain of the forceps, *pari passu* lessens the domain of turning. This is a crucial test of the value of the axis-traction forceps."

Two other instruments, more or less novel, also deserve more attention and better description than they receive in this section. They are the cranioclast and Braun's decapitating hook. To the former efficient and useful instrument no description at all is accorded, while two cuts are given to Tarnier's complicated and expensive basiotribe. For all that the student could gather here, the cranioclast and the cephalotribe are the same instrument, and although the former is illustrated, as applied, by two cuts, he would be further confused by reading of crushing the head by the screw working at the ends of the handles, when neither cut shows any screw. In regard to Braun's decapitator, there is not a word to indicate that it is an instrument differing from all others devised for effecting the same purpose. Indeed, the text is misleading, for with-

<sup>1</sup> *Traité Pratique des Accouchements*; two volumes, Paris, 1883.

out any distinction being made, it is treated in the same paragraph with Ramsbotham's decapitating hook, an instrument provided with an edge, which Braun's hook has not. Nor is the matter helped by the illustration; Braun's hook appears in the drawing exactly as if it were a cutting instrument. Neither as to construction nor mode of action, then, is this instrument fairly presented. The student is presumed to know all about instruments, to have had them shown for inspection during his course of instruction. This is an assumption more complimentary than satisfactory; it is a fault often committed by Dr. Barnes, and not unfrequently by writers who teach in large hospitals where demonstration accompanies every step. It is a fault of which an author should not be guilty who writes upon a subject so cosmopolitan as obstetrics; it is the provincialism of a metropolis.

We regret to be compelled to say that the amount of attention bestowed in this section upon the new operations is singularly unsatisfactory. To obviate some of the dangers, and lessen the risk of Cæsarean section, several modifications have been lately not only proposed, but executed, and a certain amount of experience with them has been gained, while neither of them has, as yet, conquered a position of acknowledged superiority. In this country we have had the revival of laparo-elytrotomy, and in Germany and Italy the Müller and Porro operations are being executed. It may be safely said that no subjects connected with operative obstetrics are to-day invested with such an interest as these operations, the best manner of performing them, and the relative results thus far attained. Whoever looks in this book to find either will be sadly disappointed. Laparo-elytrotomy is disposed of in less than half a page, Porro's operation in a little more space, while Müller's is dismissed with just *three lines*! As to the technique of the different operations, the barest statement of the different steps is made as to Porro's, while in laparo-elytrotomy it is stated that the vagina is to be incised, and not a word is said of the necessity of tearing it in order to avoid hemorrhage. Again, these operations are before the profession, awaiting the verdict of further experience. Surely, to look for some expression of opinion, from an author so well acquainted with the practical side of obstetrical art, as to what that verdict will be, is not expecting too much. It is not here; neither are there comparative statistics. The new operations are to be judged by a comparison of results obtained with those of the simple Cæsarean section. No data are given. It would be deemed scarcely possible that a work should be published claiming to be "up to the times," and yet present no results of this latter operation more recent than the general statement of Pajot, in 1875, and the summing up of Schröder, of 1874. It pleases Dr. Barnes in this work to deprecate the value of statistics in obstetrics, he does it repeatedly; yet we think that just here some statistics later than those of a decade ago would be of value, that even those of this country, of an entire continent, collected with such indefatigable industry by Dr. Robert P. Harris, were deserving of reference mention, if not of reproduction, since they have a bearing of great practical value upon these operations.

No subject connected with obstetrics has made greater progress within about twenty years past than extrauterine gestation. With the plea for laparotomy after bursting of the cyst by Stephen Rogers, of New York,<sup>1</sup> it

<sup>1</sup> Transactions of American Medical Association, 1867.



entered upon a new era, while the treatise of the lamented Parry<sup>1</sup> added much to our knowledge and stimulated study of the subject. In diagnosis we have left far behind the dictum of Depaul as to its impossibility, while as to treatment substantial advances have been made of the most gratifying character. It is with regret that we do not find the chapter upon this subject by Dr. Barnes abreast of the times in any of these particulars, nor is the general treatment of the subject satisfactory. First, it is marred by too many subdivisions, with a series of symptoms for each. Thus, we have tubal, abdominal, and tubo-uterine varieties, and besides these the "retro-uterine" dependent merely upon the accident of location. This cannot but confuse both student and practitioner. Even to the latter it is difficult enough to establish the fact of an extrauterine pregnancy without attempting to distinguish the particular variety. To assist in establishing the fact itself the symptoms should be clearly presented and strongly emphasized, and although the diagnosis of this condition will frequently prove one of the most difficult of problems for solution, there are a few strongly marked symptoms almost always present, which, if heeded, will at least put the practitioner upon his guard and excite the closest investigation. Gestation in the tube is given by Dr. Barnes as the type, and we read:

"A tubal gestation may be predicted from the presence of the usual subjective signs of pregnancy, added to which is pain—this, says Goupel, is constant; and the local objective signs."

Now if there be one marked characteristic of the pain of extrauterine gestation it is its recurrence in attacks of the severest kind; it is agonizing in degree, but intermittent in character.

The next most prominent symptom of extrauterine pregnancy is hemorrhage—gushes of blood occurring at irregular intervals. This symptom is not only unemphasized, it is not mentioned in this connection. On a preceding page it is said that "hemorrhage commonly precedes bursting of the sac," and this is all. Some hundreds of pages further on, in the chapter on placenta prævia (p. 574), we read the following:

"Robert Barnes drew attention to a fact, now generally recognized, that, before the rupture of the Fallopian sac in tubal gestation, discharges of blood by vagina often take place."

Does Dr. Barnes intend to convey the impression that he *first* drew attention to this fact? It appears so, because he gives a foot-note to his work on *Diseases of Women* as if to clinch the statement. The symptom was not only mentioned by Rogers in his essay, but its importance impressed, the doctrine urged that when a patient presented this symptom, together with attacks of severe pelvic pain, there need scarcely be further doubt as to the existence of extrauterine pregnancy.

There is one other symptom of this important abnormal condition not always present, but when it occurs is held to be pathognomonic. We allude to the expulsion of the decidual lining of the uterus. Again we have to note total omission. This leading symptom is not mentioned at all by the author. That the decidua is formed is stated, and a figure of a specimen given, but there is not a word as to the diagnostic import of its extrusion! The account of the "local objective signs" is also far

<sup>1</sup> On Extrauterine Pregnancies, Philadelphia, 1876.



from satisfactory. It is doubtful whether a tumor can be at once "fluctuating" and "tense," and we find no allusion to the marked vascular action in the tumor usually to be observed by the touch, nor is there any allusion to its rapidity of growth which can be observed certainly from week to week, a point insisted upon by Thomas.

When we come to the treatment of this condition, we find matters still worse. Under the light of recent experience all remedies and all measures must yield precedence to one, electricity. None are worthy of any thought or consideration until this has been tried. Let us see what Dr. Barnes says of it:

"Bachetti proposed to kill the embryo by passing an electric shock through the cyst. Duchenne suggested the shock of a Leyden jar." P. 246.

"During the first stage the embryo or fœtus may be killed by Duchenne's plan of shock by a Leyden jar." P. 248.

This is all! It "has been proposed" to kill the fœtus by electricity! Now, how stand the facts? Professor Allen's two successful cases with faradization have been before the profession since 1872. If there had been but one, it would be the duty of every teacher to urge a trial of the remedy for a condition so perilous as extrauterine pregnancy, as a means of escape from a calamity so overwhelming as rupture of the sac. But there have been nearly a dozen successful cases. There is a mass of testimony in favor of this remedy which is simply overwhelming. It is to be found, too, in the transactions of a society of which Dr. Barnes is an honorary member.<sup>1</sup> And yet, with the responsibility of a teacher upon him, he still recommends puncture of the sac, the fatality of which is notorious, or thinks that, in the abdominal variety, "upon the whole, expectancy is perhaps the wisest course!"

The author's name is closely associated with the subject of placenta prævia, and every one into whose hands this volume comes will turn with interest to see what modifications, if any, his doctrines have undergone, or what support increased experience has given to them. The more closely the name of a teacher is connected with any particular doctrine in medicine, the more carefully should his writings be scrutinized, especially as to accuracy and impartiality. At the outset one cannot avoid expressing the wish that something more of simplicity had been attained in the treatment of this theory-ridden subject. What possible good, for instance, can arise from debating whether the hemorrhage is caused by the ovum growing away from the uterus, or the uterus growing faster than the ovum? The point cannot be settled, and if settled would be of no practical value. The real cause we have seen given in clearer language than that of Dr. Barnes:

"An efficient cause of hemorrhage, interstitial and continuous, we believe to be irregular, spasmodic uterine contractions. The presence of the placenta over the os uteri is a cause of reflex irritation [?]; and irritation, once begun, is almost certain to go on, and this in an irregular, metastatic [?] manner. There is perverted polarity."

We wish, also, that there was something less in this connection of "Barnes's discovery"—of "Robert Barnes's discovery of the distinction

<sup>1</sup> Transactions of American Gynecological Society, vol. vii.; Electricity in Extrauterine Pregnancy, by Henry J. Garrigues; History of Twenty-one Cases of Extrauterine Pregnancy coming under Personal Observation, by T. Gaillard Thomas, vol. ix. A further report upon extrauterine pregnancy, six additional cases, by the same author.

between the upper part and the lower third of the uterus." If the author has made any discovery of value in regard to placenta prævia, it is in regard to treatment. There is surely no "discovery" in pointing out the portion of the uterus, in proportion to the occupation of which by the placenta, is the danger. This is a fact recognized by all since this vicious implantation of the placenta has been understood, although the author's division of the uterus into "zones" of safety and of danger makes an admirable and impressive student's demonstration. In regard to this point, Dr. Barnes prides himself much upon "Bandl's ring" as confirmatory of his discovery. Since the existence of this ring has been called in question, we must await further anatomical research.<sup>1</sup> Neither can the cessation of bleeding upon dilatation of the cervix sufficient for the head to pass be considered a "discovery" until it shall be shown to be a universal, and not an exceptional, occurrence.

The statement that "the greater hydrostatic pressure in the vessels, when the placenta is prævious, than is the case when it grows to the fundus," has a strong influence in promoting the hemorrhage, is pure hypothesis.

In the treatment of placenta prævia by Dr. Barnes, some points deserve consideration. Recognizing the importance of efficient uterine contraction, the existence or the absence of which gives such a different aspect to a case, he directs, first, puncture of the membranes, supplemented by a firm abdominal binder. The next step, the os remaining undilated, is the tampon, and this is far from receiving the estimate it deserves. A proper application of the measure does not consist in "ramming soft substances into the vagina," as Dr. Barnes speaks of it. Nor does he give here any directions for properly applying it, and says nothing of the importance of using a speculum for the purpose, without which it cannot be made efficient. There need be little wonder, then, that he has scant confidence in a tampon; but, when we read that it is "to be removed in an hour at the furthest," we wonder more what it was ever applied for. In this low estimate of the value of the vaginal tampon, in certain conditions a most valuable resource, the author stands alone among authorities.

The special point in the treatment of placenta prævia which Dr. Barnes warmly advocates is, as is well known, separation of it from the uterine walls by sweeping the finger around the cervix as high up as it will reach. This, he claims, is a measure original with him, one of great value, and one which yields decidedly more favorable results than any other plan of treatment. It is open at once to the objection which Robert Lee made to Simpson's plan of entire detachment and removal of the placenta, and which is quoted here: "How is it, then, that furious flooding takes place when the placenta is in the pot under the bed?" He has had but a meagre experience with placenta prævia who has not learned that the patient is not safe from flooding, even after the third stage of labor is completed. This partial separation having been effected, "*often the hemorrhage ceases.*" As much can be said of Simpson's method, and the same result sometimes follows when nothing has been done. But it is not necessary to enter into a debate as to the value of Dr. Barnes's measure; that remains to be determined by further clinical experience. There is something to be said, however, of the manner in

<sup>1</sup> A Note on Bandl's Ring. By Wm. T. Lusk. Trans. Amer. Gyn. Society, vol. ix. NO. CLXXXII.—APRIL, 1886.

which he presents and would sustain it. We regret to see that he is in several particulars decidedly unfair, to use the mildest expression, toward other systems of treatment, and the facts supporting them, and that he shows the characteristics of the advocate, rather than the man of science. Thus we read:

"Before the views of Robert Barnes prevailed, the practice was to deliver at once; and this was often done without much regard to the fitness of the parts to undergo this severe proceeding."

Again: "The unavoidable hemorrhage theory, simple and absolute, dictated, as we have seen, immediate delivery, the *accouchement forcé*. . . . What does the *accouchement forcé* mean? Literally and practically, it means violent delivery at all risks. The hand was *forced* through the cervix, dilated or not dilated. . . . This forcible entry accomplished, the child was then seized, turned, and extracted as promptly as possible."

We regret to be compelled to state that this is simply not a true statement of the treatment of placenta prævia "before the views of Robert Barnes prevailed." Ramsbotham and Churchill, Meigs and Hodge, were immediate predecessors of Dr. Barnes, and they all teach that the hand is only to be introduced when it can be done "without incurring the risk of injury," and they recognize such delivery as here described as entirely exceptional, only now and then a deplorable necessity, a last resort to save a perishing patient.

Further, Dr. Barnes keeps in the background the fact that the flooding of placenta prævia generally induces a relaxed and dilatable condition of the cervix. Not only does he fail to hold this fact out to the practitioner as a foundation for some hope when worst comes to worst, but he speaks of it as "the arbitrary hypothesis which assumes that, in these cases of flooding, the os uteri is, by the flooding, *always* made easily dilatable." Dr. Barnes owes it to himself to support the italicized word by references. We were under the impression that the doctrine is, that the os is thus *generally* affected. Either we are wrong, or the author has misrepresented obstetric authorities. However, in denying this usual effect of hemorrhage, Charpentier says that Dr. Barnes is in opposition to the generally accepted views of the profession.

The practical results of treatment are, of course, the crucial test. Dr. Barnes gives "his experience of the terminations in 69 cases; the deaths 6—*i. e.*, 0.9 nearly." Of course, this is a typographical error; it should be "9 per cent. nearly." This is not later than 1864! All results given since then are five cases in 1884, all the mothers and four children recovered. This mortality of about 9 per cent. is exceedingly satisfactory, yet it is greater than that given by Spiegelberg as resulting from the earliest possible delivery, which was, under Hoffman, 6 per cent.; Hecker, 7.5 per cent.; and by himself, 5.4 per cent.; this, however, independent of the loss from puerperal diseases following.

The many questions yet unsettled in regard to puerperal fever, and the great interest attaching to the subject, render it imperative that the views of one occupying so high a position as Dr. Barnes, both as a teacher and writer, should be presented to our readers. It is an exceedingly difficult task to perform. The author is not methodical in his divisions and subdivisions, not always clear in statement, and often confusing. We will try to present briefly, but fairly, and as clearly as possible, his teachings upon this disease, in which, it is well said, "we find the reflection of every doctrine prevailing in medicine from the



days of Hippocrates." The chapter is headed "The Puerperal Fevers." It includes the various local affections known as pelvic cellulitis and peritonitis, as well as phlegmasia dolens, under the name of "thrombotic puerperal fever." These diseases are "puerperal" certainly; they are accompanied by "fever," also; yet it is evident that the student's interests would have been better consulted, by placing these affections, in all of which the local are more prominent than the general symptoms, each in a chapter by itself. But the plural term is distinctly used for the general disease, and the doctrine emphasized that there are puerperal fevers. We are surprised, however, to see this author refer to Meigs as one who "wrote of childbed fevers." There is not in obstetric literature a more fervid apostle of the doctrines that puerperal fever is always the same, that it is an inflammation, and only and always an inflammation, than Meigs. "The disease is *one*," he says, "the writers and talkers are legion."<sup>1</sup>

As varieties of the disease cannot be made upon a basis of pathological anatomy, Dr. Barnes recognizes first a "simple excretory fever," arising from failure of excretion from the blood of, *a*, lactic acid, the result of the violent muscular action of labor; *b*, the waste of uterine and other tissues of gestation. These two poisonings are forms of endosepsis. Then comes a form arising from poisoning by absorption of foul stuff from the genital canal. So far, the fever is an autosepsis, and so far the disease is autogenetic. Then comes the form dependent upon infection or inoculation of some foreign poison; this is exosepsis. Next we have the zymotics, depending upon scarlatina, diphtheria, and erysipelas, and these, with the preceding, are the heterogenetic forms. "Thus we may understand that there may be a *simple* endosepsis, that autosepsis is grafted upon endosepsis, and exosepsis is a compound of all three."

Two questions relating to puerperal fever, or the febrile affections of childbed, if the term be preferred, are of passing interest at the present time. These are, the relation of these affections, in origin and nature, to septicæmia, and their dependence or non-dependence upon micro-organisms.

The theory of the septicæmic nature of puerperal fever, now most widely accepted, is closely connected with the traumatic origin of the disease, and both are considered together by Dr. Barnes. The origin of "traumatism" is attributed to German lying-in hospitals. We had always thought this doctrine began with Cruveilhier's likeness of the uterus to the stump of an amputated limb, and that Simpson was one of the main supporters of it. The doctrine is but very briefly considered here, and curtly and dogmatically dismissed. "The wounds in the puerpera are physiological," but why this makes them any less possible entrances of poison we are not told. "The wounds are inevitable, and if kept clean, and the subject is healthy, are harmless." "Traumatism alone cannot induce puerperal fever. Traumatism is universal, and fever is exceptional." "Appeal to the hypothesis of traumatic fever is vain." The objection is made to the septicæmic theory that septicæmia is a compound term, there are varieties of it, as there are varieties of puerperal fever. But we find here not the slightest attempt to harmonize doctrines, by pointing out the possible modifications of the morbid process caused by the altered state of the blood of the pregnant and puerperal woman, so

<sup>1</sup> Treatise on Obstetrics, Philadelphia, 1852.



justly estimated by Dr. Barnes in other parts of the work; all effort is directed to show that the diseases cannot be identical, none to show the similarity existing between them. The strongest arguments against the septicæmic theory, fully accepted by its adherents may be given in two lines: "It does not account for cases before there is a wound, nor for the propagation to non-puerperal women." But the strong argument against the septicæmic theory to be drawn from the undue proportion of unmarried puerperæ who suffer from puerperal fever he does not use at all. Altogether, the subject is not nearly so well treated here in what is intended to be a standard treatise, as in an essay the author published in the *American Journal of Obstetrics*.<sup>1</sup>

To the great question of the dependence of puerperal fever upon microorganisms Dr. Barnes devotes just two pages, and what he gives is not only limited, but partial. Nearly one page is quoted from Charpentier, and gives Raymond's representation of Pasteur's views. It is very singular to find, upon turning to Charpentier, that six pages of that work, devoted to the views of Doleris, whose treatise, Charpentier says, is no more than a faithful translation of Pasteur, are passed over unnoticed to reach Raymond's views, which are quoted. Is it because the objections to the doctrine follow immediately upon this quotation, and are copied, without credit? The whole paragraph, on page 679, of Dr. Barnes's work, beginning, "And how, it has been pertinently asked," is translated, word for word, from Charpentier, without quotation marks or reference. Is it because that quotation ends with the following remark?

"When we consider the variety of forms presented by puerperal fever, it is difficult to admit that it is caused by an infecting agent, one microscopic organism."

This sentence, standing alone, seems to throw doubt on the matter, but it does not touch the main question at all. If it was worth while to present Pasteur's views, Dr. Barnes could have found, within six pages of the above quotation, the following decided language:

"One undoubted fact results from all observations and all experiments—*the presence and the action of inferior organisms*. In accord upon this point with all investigators who have preceded me, I can affirm *that the morbid germ of the disease, always present in the sick woman, is always absent in the healthy one*, that this germ is a living organism, susceptible of reproduction under the unequivocal conditions of rigorous experiments, and capable of reproducing nearly constantly the lesions connected with the phenomena observed in patients harboring them; that the morbid germ differs in a certain measure according to different forms of the disease, and, I will add, according to the lesions, which appears to me more exact."<sup>2</sup>

Is all reference to Doleris omitted because he is said to have proved the pathogenetic character of bacteria by cultivating them, and by injecting them into animals reproduced the pathological lesions of puerperal fever? It would seem that a treatise upon a subject of so great importance as this of Doleris,<sup>3</sup> one so recent and so revolutionary, should have received some notice, and its doctrines some statement in a work which aims at presenting all subjects pertaining to obstetrics in their latest aspects.

<sup>1</sup> On Septicæmia in Midwifery and Antiseptic Midwifery, January, 1882.

<sup>2</sup> Charpentier, t. ii. p. 885.

<sup>3</sup> La Fievre Puerperale et les Organismes Inferieurs, 1880.

Dr. Barnes closes this section of the subject with three short paragraphs:

"When, in any case of puerperal fever, the presence of these micrococci has been detected in the exudation, they have also been found in the deeper organs.

"Other microorganisms may be present, but their presence in the dead body does not always prove that they existed in the living body; they are often the result of post-mortem decomposition.

"It is as yet impossible to classify puerperal fever as regards course and prognosis according to the varieties of the microorganisms found (Dolérís), or according to their mode of invasion (Fraenkel)."

This is all. Not one of them bears upon the main question at issue: "Does puerperal fever depend upon the presence of organized beings?" nor is there even an approach to an expression of opinion upon this point. But, again, these three paragraphs are taken, word for word, from Somer's admirable paper,<sup>1</sup> without credit and without quotation marks.

On another page Dr. Barnes quotes Somer, and gives in a foot-note the title of his paper. He knows the paper, therefore. Then why did he not quote such sentences as these, which may be found in it?

"The chain-like micrococci have frequently been found both in the exudations and in the organs of patients having died of puerperal fever.

"It seems as though all who sought for them have been able to find them in every case.

"Not only can these germs be found in such patients, but that when puerperal fever as such does not exist, they cannot be found."

We are not attempting to maintain the germ theory of this disease. We have not the slightest disposition to censure Dr. Barnes for not accepting it. There are several links wanting in the chain of evidence sustaining it, and some very good men, besides the author of this book, cannot yield assent to it. But he is open to censure for this unfair treatment of the subject, and for this partial statement of evidence. Every purchaser of his book has a right to expect in it a full statement of the facts bearing upon, and the opinions of the latest authorities in regard to it, such a presentation as has been admirably made to the profession of this country by Dr. Lusk.<sup>2</sup> It is a great subject; it contains within it the solution of problems of vast import; it certainly projects, as on a screen, some of the features of the pathology of the future. To see it thus treated in a slipshod and unscientific manner is a most bitter disappointment, and thus to treat it is unworthy of the author's reputation.

Connected with the relation of puerperal fever to the zymotic diseases there is one doctrine prominent in British obstetrical authorities which it is difficult to harmonize with the experience of the profession of this country. It is the far greater importance assigned to scarlatina as a cause of the disease. This is very far beyond anything recognized here. Thus, in Dr. Barnes's work, we read the astounding statement that

"If we can prevent scarlet fever only, we shall have diminished the number of puerperal fever cases by at least half."

<sup>1</sup> Our Present Knowledge of the Relations between Microorganisms and Puerperal Fever By Carl Somer, M.D., Assistant at Gynecological Clinic of Prof. Schröder. American Journal of Obstetrics, July, 1884.

<sup>2</sup> American System of Medicine; by Pepper; vol. i., art. Puerperal Fever.

The question immediately suggests itself how this statement can be reconciled with the proportion of women who must have had this disease in infancy or childhood. A further investigation of the subject shows it to be one of hopeless confusion, supported by wretched logic. Both of these statements can be substantiated from the pages of this work. Thus it is assumed by Hicks, and quoted here without dissent, that a woman may have been exposed continuously for months to the contagion of scarlet fever and still the disease not manifest itself until four or five days after labor. Again, the fact that a woman may have had the disease before, is only spoken of here as a "modifying influence" of its course in childbed, and no mention is made of the fact that a second occurrence of one of the exanthemata is an exceptional occurrence. Still, again, the most singular position is taken that there may be scarlet fever in the puerperal woman, with all its characteristic symptoms lacking:

"Thus, the rash may not be observed, at least not in its usual characteristic manner. McClintock notes that in several cases the eruption was rare in showing itself. Sore throat is probably rarely wanting altogether, but McClintock says the affection of the throat was comparatively slight in all the cases; he thinks this exemption is a remarkable feature. Braxton Hicks also found the sore throat slight in all cases. He adds—and we have made the same observation—that the influence of scarlet fever may be shown without the rash or sore throat, but its scarlatinal origin may not be indicated by the other usual characters."

It is well known that a scarlatinal eruption sometimes occurs in children shortly after they have been submitted to a surgical operation. It has been found in many cases impossible to account for this eruption by any exposure to contagion, while some of the symptoms characteristic of scarlet fever being absent, some other explanation of the efflorescence was demanded. That explanation has been found in attributing the scarlatinal eruption to septicæmia. This explanation has been accepted by very high authorities, by Mr. Holmes,<sup>1</sup> by J. Lewis Smith,<sup>2</sup> and even by Braxton Hicks,<sup>3</sup> in the case of his own son, although he is one of those who can see scarlatina in puerperal women with all its characteristic features lacking.

Now why not call this fever of childbed accompanied with a scarlatioid rash septicæmia. Those who insist upon it being scarlatina are driven to the most illogical positions. Thus, Browne, in the paper just quoted, in accounting for such a rash after a surgical operation, found that "the child's cousin had suffered from scarlatina three months previously!" But we have here only to deal with Dr. Barnes. He is not always logical. For instance, he attributes (p. 712) frequent sudden death of newborn children "under symptoms of eclampsia and trismus" to puerperal fever prevailing in the hospital, when it would be more in accordance with reason and experience to trace the diseases of both mothers and children to bad hygienic surroundings, of which the diseases were certainly proof. But, in regard to the question under consideration, the following, to which we furnish the italics, is of interest, as coming from an author who teaches the possibility of *auto-infection*:

<sup>1</sup> Scarlatina and simulating Eruptions following Surgical Operations, by J. W. Browne, B.A., M.D., M.R.C.S. Eng. A paper read at British Medical Association, 1885. British Medical Journal, October 10, 1885.

<sup>2</sup> System of Practical Medicine; by Pepper; vol. i., art. Scarlet Fever.

<sup>3</sup> British Medical Journal, June 4, 1870.



"Fever may be propagated to the woman before or after labor by the medium of the husband, or other person coming into close relation, the person serving simply as a carrier. We saw a case of puerperal fever in a London suburb, the conditions of which were subjected to careful investigation. The conclusion arrived at by three physicians was that the infection was communicated by the husband, *who had been working in the garden*, which had been made up of foul rubbish. He himself had felt unwell, *but exhibited no characteristic symptoms*. In this case the poison *may have been typhoid or scarlatina*, but this could not be determined."

But Dr. Barnes has seen these cases of scarlatinoid septicæmic eruptions. The italics of the following are his own.

"We have seen cases of *scarlatinoid rash* breaking out in puerpera, that seemed to be analogous to the similar eruptions observed in surgical patients by Paget and others. It is obviously difficult to differentiate these from scarlatina in the lighter forms, and from erysipelas."

Then why does he not go on and state upon what principles he calls one case without sore throat and eruption scarlatina, and another, with eruption, *scarlatinoid*?

Again: scarlet fever in the puerperal woman is a much more severe and dangerous disease than ordinary. He has seen "several cases recover," but it is generally fatal.

"The patient may die before any tissue changes of an inflammatory or suppurative character have been developed. But if she survives some days, and the case does not end in defervescence and cure, the most grave alterations—as peritonitis, synovitis, cellulitis, carditis, pneumonia, pleurisy, ophthalmia proceeding to destruction of the eyeball—may ensue."

The question forces itself for solution: Are such results, especially those affecting the eyeball, more frequently seen from the influence of scarlatina, or as parts of septicæmic and pyæmic disease?

We cannot continue the subject of puerperal fever, or examine any more of the individual divisions or chapters of the work, but will try to present some of its general features, especially in reference to the needs of the student. It would be extremely agreeable to say that the book compensated in this respect for the shortcomings of the parts we have gone over. But no very close reading is required to discover that it lacks, in many essential particulars, those qualifications necessary to a good manual for students. There is faulty arrangement of subjects, often a want of clearness in statement of facts, an indefiniteness as to meaning, frequent omission of important points, and a notable lack of precise statement of the author's opinion. These statements can be substantiated from the chapters upon the most practical parts of the subject. As to the first point, the chapter on the management of labor precedes that upon mechanism, a most unfortunate arrangement for the student. Then, under the head of "What to observe in the parturient woman," point after point is stated as if copied from the notes for lectures, without comment or explanation; and then, having got to tying the cord and examining the child, the author goes back again (p. 431) to treat of the second stage of labor. As an illustration of carelessness may be taken, from the same page, the statement that the rupture of the membranes "marks the beginning of the second stage of labor." Of course, Dr. Barnes knows that frequently, and especially in primiparæ, the membranes break hours before pains begin, and in another place he



says so, yet here we have the unqualified statement; and again (p. 741), he says, "generally the signs of dystocia will not be long deferred after the rupture of the membranes." Both statements are incorrect and misleading.

It would be difficult to find anything less clear, indeed more confusing, to the student, than the author's statements as to the positions. So contradictory are they, that it would be utterly impossible for any one to learn the subject from these pages, and so frequently repeated that no explanation can be framed to account for them. Thus, the subject is opened (p. 506) with the statement that the *first position* is the *right occipito-posterior*, and is the most frequent; "the forehead is directed to the *right sacro-iliac joint*!" The *left occipito-anterior* is the second position, and "the forehead is directed to the *left sacro-iliac joint*." Then:

"The simplest formula for enumerating the head positions is to carry the occiput round the circumference of the brim from *right* to *left*, beginning with the *left occipito-anterior* position. This, then, occiput to left foramen ovale, being by far the most frequent, is No. 1. Taking the occiput over to the right, we get No. 2."

On page 512, occiput to left foramen ovale is again called first position, but on page 515 a cut of Braune's frozen section is given, showing "*left occipito-anterior* position; head engaged in *second* position." The cut shows the latter in contradiction to the text. On page 507, again, the first position is stated to be R. O. A., and the second L. O. A.!

These errors are too numerous to be accounted for by faulty proof-reading, and, as before said, no explanation presents itself. Whatever the source of them, their presence renders it impossible for the student to acquire here an understanding of one of the most essential parts of obstetrics.

In the chapter upon the management of labor we find no directions for making up the obstetric bed. It may be said that this is the nurse's duty. So it is; but the student should be taught how it is to be done, for as a young practitioner, not one in ten of those he attends will have a professional nurse, and he will find that in real life his success will depend more upon making his patient comfortable, than upon his knowledge of the Cæsarean section. Having anticipated a reply as to the bed, let us look at the following, under the head of care of the recently delivered woman. It is as to "cleansing the genitals" with a solution of carbolic acid.

"The fluid should be squeezed out of the sponge, so as to run in streams over the part. *The labia majora and minora may be held gently apart to let any clots escape from the vagina.*"

Nothing is said here about the nurse doing this! A few years ago we were gravely informed in an English hospital that the side position was preferred for obstetrical and gynecological examinations, because that on the back was indelicate! We should like to know if the above is now a feature of English midwifery.

There is no subject, the treatment of which by Dr. Barnes is more unsatisfactory, than the important one of intrauterine injections. Decried by some as a measure of treatment, held by others to be indispensable even in a prophylactic sense, its possible dangers recognized by all, it

deserves from every writer on obstetrics for students most careful directions as to mode of administration. We find but few such here. In one place it is said that since the operation involves some disturbance of the patient, "the physician will do well to carry it out himself." In treating of the prophylaxis of puerperal fever he makes a strong plea for their use:

"Should there be the slightest rise of temperature and pulse this intrauterine injection is imperative. Those who have used it can tell of temperature and pulse reduced, rigors and other signs of toxæmia subsiding after each injection, and ultimately enabling the patient to pull through the most threatening illness."

The author, in his faith, goes a good way beyond any one who will read his book, as he goes beyond all scientific evidence, when he says:

"Some small portion of the carbolic acid or sublimate penetrates the substance of the uterus, and is absorbed into the system, *chasing and neutralizing any poison that may have entered*. Thus we follow the enemy through the gate which admitted it."

Now, turning over just two pages, we come to the treatment of puerperal fever, and there find the following, the first sentence of which is excellent:

"If, after having once well washed out the uterus, and ascertained that there is no offending substance in it, and yet the fever gets worse, it will generally be better not to repeat the injection. . . . It may, as Braun says, do more harm than good. It is necessary to remember that even injections of plain water may cause death. As we have seen when discussing the use of injections to restrain post-partum hemorrhage, sudden death from shock has occurred. The addition of iodine, carbolic acid, or bichloride of mercury, to injections in puerpery, does not neutralize this danger. Convulsions have followed. Carbolic poisoning has been noted."

What young practitioner, with this array of horrors before him, would ever dare to resort to intrauterine injections? And there is not a word of direction given, in connection, as to how to avoid accident. The plea may, of course, be made that duty compels warning as to the dangers of this measure. Granted. Then turn back to page 594 of this book, on the treatment of post-partum hemorrhage, and read without qualification, without comment, without warning, that *turpentine* "might be usefully injected into the uterus." It would be satisfactory to learn how many times Dr. Barnes has carried this measure into execution.

There is plenty of material to continue, but it is not necessary. We had noted a good many points relating to the subject of labor which cannot be entered upon; one or two points may be mentioned. Should a second edition of this work ever appear, we trust the author will enter a little more at length into the matter of changing face into occiput presentations by pressure of two fingers on the forehead. It is treated of here (p. 523) as if it were a very easy affair. So, also, we should like to learn more about helping the chin, in face presentations, to rotate forward, by "gentle traction" made by the finger in the child's mouth. "A very little force," it is said, will sometimes effect this, but upon what part of the mouth it is to be exerted is not said. Sometimes in medicine the *post hoc* is mistaken for the *propter hoc*, but we should scarcely

expect to find Dr. Barnes guilty of the error. Beyond and above all, the author should present to the profession the evidence upon which he bases the advice to wait upon Nature in so serious a matter as transverse or shoulder presentation. Nothing, except actual perusal, ought to satisfy any one that an obstetrical teacher in the position of Dr. Barnes could give such advice. It is to be found on page 553.

"But the practical question will arise, Is spontaneous version so likely ever to occur that we shall be justified in trusting to Nature? Ample experience justifies an answer in the affirmative."

Would it be too much to ask, in the interest of the student, for some portion of this ample experience, and also for some directions as to how long to wait upon Nature for delivery under circumstances where every other writer on obstetrics teaches that the prompt and effective intervention of art is an imperative duty?

Books, like letters of introduction, should be closely scanned for what they do not contain. There is an omission from this one as notable as it is surprising. The work contains not a word in regard to the administration of anesthetics in natural labor. Indeed, this class of remedies receives but scant recognition, even for pathological conditions. Thus, in regard to treatment of rigid os, we have the following paragraph, in which is again illustrated the author's peculiar manner of emasculating his statements by qualifications:

"Chloroform is often of signal service. It acts by annulling the sense of pain, and by restoring the equilibrium of the nervous system. . . . The sphincteric spasm relaxes, the body of the uterus contracts as it ought to do, and the labor proceeds. Tincture of opium or Hoffman's anodyne in half drachm doses, separately or combined, are almost equally efficacious. Chloral is sometimes superior to opium. It produces unconsciousness without stopping uterine contractions."

This is more than is said of chloroform in any other portion of the book, if not more than is said of it altogether, except in the treatment of eclampsia. In the above quotation is found, too, all that is said of chloral, except statement of dose, or that it may be administered *per rectum*. When we come to relaxation of the perineum, we find only the statement that "chloroform or nitrite of amyl may help by subduing voluntary expulsive effort." The author, who, it will be remembered, is a teacher of the dangers of auto-infection, does not hesitate to recommend a resort to incisions, rather than to chloroform, in order to obviate the resistance of the perineum. There is not a word as to producing anesthesia for such manœuvres as changing a face into a cranial position by passing the hand into the uterus; nor is there anywhere through the book any adequate appreciation of the value of anesthetics. The case is still worse in regard to the alleviation of the suffering of natural labor by chloroform. The only words upon the subject are contained in directions for the management of the first stage and direct its denial.

"If the patient or her friends call out for chloroform, evade complying during this stage." P. 431.

The help, it "*may*" be for the perineum, has already been given, and this is all. So one of the greatest boons ever given by art to suffering woman, one of the most efficient promoters of the relaxation of cervix and perineum, and the crowning glory of modern obstetrics, is utterly



ignored. Knowing that Dr. Barnes stood among the opponents of the introduction of chloroform into midwifery, and that he was one of the antagonists of Simpson,<sup>1</sup> we did not expect from him an enthusiastic support of obstetrical anæsthesia. But we have a right to ask him to reconcile his silence in regard to anæsthetics with the statement (p. 415) that "pain is in its essence pathological." We would not have found fault with him had he openly opposed their use, giving his reasons therefor in a manly, straightforward way, but to ignore one of the most important features of modern midwifery, to shirk its consideration, is unworthy of the position he has assumed as teacher of the art, unworthy of a representative of the country which gave chloroform to the world. The skilful administration of chloroform in labor is no trifling matter; the conditions under which it is most effective are known, its influence for good is immense, its injurious action possible, its alleviation of suffering is often like a charm. Yet the student will look in vain here for instruction as to this agent *in any* of its aspects.

This book exhibits in a marked degree some of the personal characteristics of the author. One stands preëminent above all the rest—personal vanity. The preface having stated what portions were the work of the son and of the father, the ordinary mode of expression of authors was sufficient. We have, however, "Robert Barnes" repeated throughout the book to such an extent that it becomes trying to the nerves, and when this occurs four times in a single page the query forces itself whether it would not have been better to make a running head page-line of the name. In not a few instances it is fairly dragged in. This characteristic of the author reaches the culminating point when he attaches his own name to parts concerned in the process of parturition. Thus, in this work, we have, for the first time, "Barnes's curve." This is a small section of a circle drawn around the sacral promontory. In the author's "Obstetric Operations" it is called "the curve of the false promontory." Now, in importance it is ranked with Carus's curve. Yet it cannot be a curve in the sense, nor to the extent, that the curve of Carus is, because the lower limb cannot be projected backward. Still, that there may be an arc figured here sufficient to attach a name to, if one is so disposed, cannot be disputed. Again, the two straits of the soft parts, the cervix and the perineum, it pleases Dr. Barnes to call "valves." Their resemblance to valves is certainly strained, and he gives a cut (Fig. 113), which is a gross exaggeration, of the lower segment of the uterus and of the perineum, capping the head. These are not only "valves," but they are "Barnes's valves," "Barnes's uterine valve," and "Barnes's perineal valve," and the reader finds them frequently. Many parts of the human body bear the name of some anatomist, and several diseases are known by the name of their discoverers. Such honor has been merited. But thus to perpetuate a name is only an honor when it has been conferred by general consent of the profession. For an author to assume it to himself is offensive vanity. There is another curve of parturition not yet named, that which the head makes back of the perineum after delivery in occipito-posterior position, a curve which Dr. Barnes speaks of; we can, therefore, only express surprise that he did not name this, that he did not call one "Robert Barnes's curve," and the

<sup>1</sup> Dutertre, De l'emploi du Chloroform dans les Accouchements Naturels, Paris, 1882.



other "Fancourt Barnes's curve." So, too, the one name might have been affixed to the uterine, and the other to the perineal "valve."

We regret that we have been compelled to present this work to our readers so unfavorably. But facts enough have been given to enable them to judge for themselves. If our disappointment has been great, it is because expectations were high. The work is not worthy of the high reputation the author had already honestly won. It will not aid in elevating the reputation of the obstetric literature of his country. It will not, as did the *Obstetric Operations* influence beneficially obstetrical teaching and practice. Much less will it mark an epoch in either the science or the art of which the author is a teacher. When, in the future, the historiographer shall trace the stream of obstetric literature, no part of its course will be marked by a "Barnes's curve." J. C. R.

#### A TEXT-BOOK OF PHARMACOLOGY, THERAPEUTICS, AND MATERIA MEDICA.

By T. LAUDER BRUNTON, M.D., D.Sc., F.R.S., Assistant Physician and Lecturer on Materia Medica at St. Bartholomew's Hospital. ADAPTED TO THE UNITED STATES PHARMACOPEIA, by FRANCIS H. WILLIAMS, M.D., Boston, Mass. 8vo. pp. 1035. London: MacMillan & Co. Philadelphia: Lea Brothers & Co., 1885.

UNTIL recently the study of the action and uses of medicines was necessarily confined to the clinical method. The reasons are obvious. The chemistry of the substances which act upon the body, and of the organs upon which they act, had to be ascertained to a certain extent; and the functions of the parts of the body, as well as their relations to one another, had to be determined before it was possible by the experimental method of research to elucidate the nature of the alterations of functions produced by drugs. But although pursued only within recent times, this method, in consequence of the zeal of pharmacologists, has already investigated the physiological action of most drugs, and imparted to the materia medica a truly scientific character. Some of the knowledge so laboriously gained has found its way into the practice of the day; much of it, however, has not as yet been fully appreciated by the profession, doubtless on account of the difficulty of applying it without a very accurate knowledge of the normal functions and the nature of the alterations they undergo in disease.

A work which should present a complete yet terse account of the knowledge thus far attained, and at the same time show its relations to physiology and pathology, has been desired by the practitioner. We hope he will find it in this book, to which we wish to call his earnest attention.

More than fifteen years ago, says the author in the preface, he had prepared a work on materia medica, but delayed its publication in order to make some improvements and remove some redundancies. He soon found so many uncertainties regarding the action of drugs that he determined to settle them by experiments. The labor grew unexpectedly; and from greater experience as a teacher and examiner, he came to the

conclusion that the plan of the work might be altered with advantage, and so threw aside the original manuscript and entirely rewrote the book.

In the original work he had discussed the physiological and therapeutical actions of each drug separately in the same way as in the third part of the present work, though on a more extended scale. But considering that the physician requires rather a knowledge of drugs and of the manner in which the actions of the individual members of a class differ from one another—in fact, a knowledge of the ways in which the various functions of the body can be influenced by drugs both in health and disease, he determined to devote a complete section of the work to a discussion of the methods by which the action of drugs is ascertained; to the manner in which each function can be modified by drugs; and to the *rationale* of the use of drugs in disease—i. e., to devote a section to general pharmacology and general therapeutics.

The author thus apologizes for the long delay in the appearance of his work, and gives the reader some idea of the time and labor devoted to its production. The most superficial examination of the first part of this work will convince anyone that it was the product of extensive reading, numerous original investigations, and conscientious examination of the researches of others in the same field.

The terms used in the title are defined as follows:

“By *materia medica* we understand a knowledge of the remedies employed in medicine. This knowledge may be subdivided into several divisions: *Materia medica* proper, pharmacy, pharmacology, and therapeutics.

“By *materia medica* proper we mean an acquaintance with the remedies used in medicine, the places whence they come, the crude substances or plants which yield them, the methods by which they are obtained, and the means of distinguishing their goodness or purity, or of detecting fraudulent adulteration.

“By pharmacy we mean the methods by which drugs are prepared and combined for administration.

“Pharmacology is a knowledge of the mode of action of drugs upon the body generally, and upon its various parts. It is of comparatively recent growth, but it is now one of the most important subdivisions of *materia medica*.

“By therapeutics we understand a knowledge of the uses of medicines in disease.”

It is evident that the author uses the term pharmacology in a more limited sense than is usual at the present time, and that the term *materia medica* in the title embraces only what is contained in the definition of *materia medica* proper.

General pharmacology and general therapeutics are discussed in the first section, consisting of twenty chapters and occupying 392 pages. The first chapter is concerned with the general relations between the organism and substances affecting it, and the second with the circumstances which affect the action of drugs on the organism. Beginning with the third chapter, the actions of drugs are discussed in the following order: On protoplasm, blood, and low organisms; invertebrata; muscle; nerves; the spinal cord; brain; organs of special sense; respiration; circulation; the surface of the body; the digestive organs; tissue changes; excretion; the generative system. The last four chapters of the first section are devoted to a consideration of the methods of administering drugs; antidotes; antagonistic action of drugs; and dosage.

From this enumeration of the heads of the chapters, it is apparent

that the actions of drugs are systematically traced from the most elementary substances and organisms up to the most complicated organs and systems. Having observed in his capacity as teacher and examiner that students find it difficult to apply physiology to pharmacology and therapeutics, and that most men forget those parts of physiology which they are not constantly studying, the author has given an account of the normal functions of the different parts of the body before proceeding to discuss the alterations which are produced in them by drugs, or which they undergo in disease. The discussion of the action of drugs is accompanied with a description of the methods of experimenting; and the instruments used, anatomical and physiological *data*, and modes of action of drugs are illustrated by carefully executed diagrams. And where it seemed necessary in order to render the use of medicines in disease more intelligible, the discussions of the actions of drugs are interspersed with brief explanations of pathological questions. The uses of medicines or groups of medicines acting upon any organ or system, are fully considered, and, where necessary, the special uses of members of groups are pointed out.

No space is devoted to historical *data*, except in the brief history of anæsthesia. It is pleasant to find that here, also, the author exhibits a thorough familiarity with his subject. He accords to Dr. Crawford W. Long, of Athens, Georgia, the honor of having first produced anæsthesia by the inhalation of ether. This physician, in 1842, successfully anæsthetized a patient in order to remove a tumor. Horace Wells, in 1844, employed nitrous oxide gas as an anæsthetic. Morton, in 1846, at the suggestion of the chemist Jackson, produced anæsthesia with ether, without knowing of its previous use by Dr. Long.

Section II. treats of general pharmacy. It discusses the groups of pharmaceutical preparations which are officinal in the U. S. P. of 1883, and the B. P. of 1874. The officinal names of preparations are tabulated, and opposite each name is placed the ordinary small and large dose. These lists the author intended merely for reference, and not to be learned by heart by any student. Indeed, he protests against the injustice of demanding too much from the memories of students. On this account, also, he does not mention the composition of the preparations, except the infusions and various compound pills. But, for this very reason, namely, that the memory cannot retain the composition of pharmaceutical preparations, except in few instances, a text-book should not omit it. Every practitioner, when he prescribes large doses of a preparation which, in excessive quantities, may produce disagreeable or toxic effects, feels the necessity of knowing the quantity of the crude drug which it contains; and he will frequently consult his text-book, because he cannot retain such knowledge. There is a still more weighty reason why a text-book adapted to both the U. S. P. and the B. P. should contain an account of the composition of all the important preparations. In some instances the composition of the same officinal preparation differs very markedly in the two pharmacopœias. Thus, the tincture of aconite root of the U. S. P. contains one part in two and a half, while the tincture of aconite of the B. P. contains one part in eight. The dose of the former is stated in the section on general pharmacy to be from 1–3 minims, and that of the latter from 1–10 minims. But in the article on aconite, in the section on the vegetable materia medica, no mention is made of the



tincture of the U. S. P., and the dose of the tincture of the B. P. is stated to be from 1–5 minims.

A similar difference exists in the composition of the tincture of belladonna in the two pharmacopœias. The tincture of the U. S. P. contains one part in seven; the tincture of the B. P., one part in twenty. In the article on belladonna, the dose of the U. S. P. tincture is 8–30 minims, and that of the B. P. 5–30 minims. No serious results will follow from the maximum dose of the United States tincture; but the British practitioner may be sorely disappointed by the feebleness of his preparation.

Sections III., IV., V., and VI. discuss respectively the inorganic materia medica, organic materia medica, vegetable materia medica, and drugs derived from the animal kingdom.

Three indexes complete the work: a general index, an index of diseases and remedies, and a bibliographical index.

Having thus indicated the general arrangement and scope of this work, we will examine a few parts more closely; and, as it is intended for practitioners as well as students, we will pursue the course which the former will adopt in seeking for information regarding the action and uses of the more important medicines.

We will select, first, the most important drug of the materia medica—opium. It was long ago established by empirical observations that opium produces sleep, relieves pain, and causes constipation. But how these effects are brought about was not known until its physiological action was investigated by the experimental method. Theories, or rather hypotheses, were indeed entertained, which, for the most part, have been found erroneous, and, in so far as they were permitted to influence the therapeutic uses of opium and other hypnotics, impeded the advance of rational treatment.

Opium is fully considered in the section on the vegetable materia medica, and is referred to some twenty-five times in the section on general pharmacology and therapeutics. To ascertain the mode in which it produces sleep, it is necessary to consult the chapter on the action of drugs on the brain. There we find that opium and morphine “seem to act by depressing the functional activity of the brain itself, although along with this depression an anæmic condition of the organ sets in.” Doubtless every reader knows that only a short time ago it was taught that hypnotics act by producing cerebral anæmia. This theory was founded on the fact that some of the early observations on the brain by trephining appeared “to show that during sleep, whether it has come on naturally, or has been induced by narcotics, such as a small dose of opium, the brain is anæmic.” The effect was mistaken for the cause. Every organ, but especially the brain, when functionally active, is freely supplied with blood; but when the activity ceases, soon becomes anæmic. Hence, the brain under the depressing influence of opium soon becomes comparatively bloodless. In recent careful observations the brain was not anæmic during the sleep induced by hypnotics, unless the sleep had continued for some time. Thus Binz (*Arch. f. exp. Path. u. Pharm.*, Bd. vi. p. 310) observed in animals that the sleep induced by chloral or ether was not accompanied by an anæmic state of the brain. But after the sleep had continued for some time the surface of the brain became pale. The anæmia thus resulted from the inactivity of the brain, and was not the direct effect of the hypnotic. This observer also found that thin sections of brain, exposed to the action of very dilute



solutions of chloral for several hours, presented a marked alteration in appearance, the cells having become darker and more granular, and the nuclei more sharply defined. Morphine, chloroform, ether, bromine, chlorine, iodine, and ozone, produced a similar change in thin sections of brain. Binz supposes that hypnotics cause an exceedingly feeble and transient coagulation of the protoplasm and nuclei, during which the brain cells are unable to perform the functions of the waking state.

The mode of action of hypnotics is of much importance. A few years ago it was held by eminent writers on nervous diseases that bromide of potassium induces sleep by rendering the brain anæmic, and that, since it causes cerebral anæmia, it would prove a useful medicine in cerebral hyperæmia and inflammation. Soon after this theory came into vogue, some physicians supposed that meningitis might be favorably influenced by the use of large doses of bromide of potassium.

How does opium cause constipation? It has been long supposed that opium arrests peristaltic movements of the intestines, and this view seems to have been fully confirmed by experimental researches, which have also cleared up the manner in which it may modify peristalsis. The author, in the chapter on the action of drugs on the digestive system, gives a pretty full account of Nothnagel's experiments, by which it seems to have been proved that moderate doses of morphine arrest peristalsis by exciting the inhibitory fibres of the splanchnic nerves. Large doses may have the opposite effect, and thus increase peristalsis. Opium eaters, who consume large quantities, are generally not constipated.

While the constipating effect of ordinary doses of opium and morphine have been observed for centuries, it has not heretofore been known that very minute doses, in certain pathological states, may promote peristalsis, and thus overcome constipation. We owe this important observation to Drs. Littlejohn and Brunton. Dr. Littlejohn noticed in a case of ovarian tenderness that half a grain of opium, given to relieve the pain, acted as a purgative. It occurred to Dr. Brunton that in such a case the constipation might be due to reflex irritation of the inhibitory nerves by the tender ovary. It seemed probable that small doses of opium would lessen the action of the inhibitory nerves and divert the stimulus from them on to the stimulating fibres, and thus produce purgation instead of constipation. One drop of tincture of opium was given in a teaspoonful of water at night. This dose was not only sufficient in most cases, but in one case proved excessive, doing no good, while half a drop acted as a brisk purgative. He supposes that opium used in this way will not act as a purgative in cases of constipation depending upon general insensibility of the intestinal nerves. The cases in which it is most useful are those of delicate women of a nervous temperament, suffering from ovarian pain, and, in whom, ordinarily, purgatives produce excessive action followed by constipation.

Quinine is a medicine of very great power. In malarial affections it quickly arrests the paroxysmal attacks of fever or pain, in many febrile diseases it lowers the abnormally high temperature, and in cases of general debility frequently aids greatly in restoring the normal vigor. Hence it is often used, and sometimes abused. It is, therefore, of great importance that the student acquire clear ideas of its mode of action, of the indications for its use, and of the appropriate methods of administration.

How does it cure malarial fevers? The author discusses its mode of action as an antiperiodic in the chapter on the action of drugs on protoplasm, blood, and low organisms. He defines antiperiodics as "remedies which lessen the severity or prevent the return of attacks of certain diseases which tend to recur periodically." The mode of action, he says, is not definitely settled, nor yet is the pathology of the diseases which they prevent. Still there is considerable evidence for considering that malarious conditions are connected with the presence of a bacillus. The periodical return of the attacks is probably caused by the growth of successive crops of these pathogenic organisms, and antiperiodics may be supposed to interfere with their development. The mode of using quinine in malarious affections is described on p. 801, where the author says: "It should be given in doses of three or four grains, three times a day, or in a single dose of ten grains, just before the fit comes on; it will often cut short a fit of moderate intensity. An emetic or cholagogue should be given before it." The reason for the last advice is that quinine forms with bile a salt which is sparingly soluble, and hence the presence of bile may interfere with the absorption of quinine. From the small doses recommended, it is evident that the author refers to cases of moderate intensity. It is doubtful whether ten grains, given just before the fit comes on, will notably lessen its severity. To accomplish this, or to prevent its coming on at all, we would suppose it necessary to give the dose more than three hours before the expected paroxysm, in order that there may be sufficient time for complete absorption.

How does quinine lower febrile heat? Antipyretics are discussed in the chapter on drugs acting on tissue change. There it is stated that antipyretics act either by lessening the production of heat or by increasing the loss of heat, and that quinine acts in the former manner—that is, it diminishes tissue changes. For the evidence establishing this fact the reader must consult the chapter on the action of drugs on protoplasm, blood, and low organisms. Under the head of general action (p. 799) the results obtained experimentally are briefly stated, from which it is seen that quinine combines with *albumen*, rendering it less soluble and more coagulable; that it lessens *protoplasmic* and *amœboid movements*, and destroys low animal and vegetable organisms; that it diminishes *oxidation*; that, in large doses, it arrests *fermentation*, especially when it depends on organized ferments; and that it is a powerful antiseptic. Under the head of uses of antiseptics (p. 106) it is said that "antiseptics are chiefly employed in febrile conditions, in order, if possible, to lessen the growth of the septic organisms and to remove the danger to the individual which the fever itself would occasion." Under the head of uses (of quinine), p. 802, the author says: "As an antipyretic, large doses (five to twenty grains) lessen the temperature in typhus, enteric, and other fevers. It is better to give a single large dose once a day, or two doses of five grains, given in the same hour, between five and six in the evening." The doses recommended may be efficient in light cases; but we have never observed any notable effect, when the temperature was 105° F., from doses less than twenty grains. The author holds that quinine should always be given in solution, as, when given in the form of powder, some of it passes out in the feces.

How does quinine act as a tonic? Tonics are defined (p. 356) as "remedies which impart permanent strength to the body, or its parts." And according to their mode of action "they have been divided into

blood tonics or hæmatinics, vascular tonics, gastric tonics, intestinal tonics, and nervine tonics." The author nowhere gives a satisfactory explanation of the mode of action of quinine as a tonic. On page 800 it is said: "In man small doses give tone to the system generally." But how this happens no one knows. Perhaps the physiological action of quinine on the stomach is held to be a sufficient explanation. Of this the author says: "When taken into the stomach small doses increase the appetite, especially in atonic dyspepsia, but if the stomach is irritable quinine causes loss of appetite, and may produce nausea and vomiting (p. 319). If the stomach be congested, the flow of mucous secretion will be increased by quinine." It is evident that quinine, when it increases the appetite, and thus indirectly causes more food to be digested, will invigorate the system generally; but that it can give tone to the system generally, when it does not improve the digestive process, is extremely doubtful. Many physicians, however, give small doses every two or three hours, in various diseases attended with debility, in order to give tone to the system generally.

Digitalis, and medicines acting like it, produce striking effects in certain cardiac affections. While digitalis does much good in cases to which it is adapted, in others it may do great injury. In some forms of dropsy it displays remarkable power, in a few days causing the dropsical swelling to disappear; in other forms it is powerless, and if given in large doses, or for a long time, may produce sudden death.

On account of these decided therapeutic and toxic properties, the physiological action of digitalis has been investigated by numerous observers; and it is perhaps as well ascertained at the present time as that of any drug. All experimenters have noticed that digitalis readily slows the pulse in healthy persons; but in febrile diseases this effect is not so easily produced, and sometimes it cannot be brought about. For many years it has been known that digitalis slows the pulse by stimulating the vagus nerves, the inhibitory nerves of the heart. But it was not understood why it should exert less power in febrile affections than in health. While this work was passing through the press, Dr. Brunton made some experiments which appear to show that a very high temperature has a depressing effect on the vagus centre in the medulla oblongata as well as on the ends of the nerve in the heart. It does not completely paralyze but greatly weakens them, so much so that digitalis and probably all drugs which act like it, such as adonidin, no longer slow the pulse as they do at normal temperatures.

The diuretic action of digitalis has been studied with great care. In some diseases, especially in cardiac dropsy, a very marked increase of the urine occurs; but in hepatic and renal dropsy little or no change takes place in the quantity of the secretion. It is generally held that digitalis is active in cardiac dropsy, because it increases the energy of the heart's contractions, thus augmenting the quantity of blood thrown into the arterial system; and that it fails in all cases of dropsy in which the blood-pressure is at its normal or maximum height. For this reason also, it is supposed, no diuretic action is displayed in healthy persons. Brunton, however, found in his own person a decided increase of the urine when he took large doses, so as to produce symptoms of poisoning. In cases of poisoning by digitalis, the author says, a marked diminution in the flow of urine frequently precedes a fatal issue, and he and Mr. Power found, after injecting digitalis into the veins of a dog, that the



secretion of urine became entirely arrested when the blood-pressure reached its maximum, and again commenced when the blood-pressure began to fall. While the urinary secretion becomes diminished, as a rule, both in men and animals when symptoms of poisoning supervene, it was markedly increased in Brunton's own person. He explains this discrepancy by supposing that in his own case the blood-pressure was low. It follows, of course, that digitalis may be used as a diuretic whenever the blood-pressure is low, and that it should never be used when the blood-pressure is abnormally high.

Brunton agrees with most authors regarding the cumulative action of digitalis, but his explanation of it can hardly be regarded as satisfactory. He discusses cumulative action in the chapter on the circumstances which affect the action of drugs on the organism. He says cumulative action

"may be due to arrest of excretion, as in the case of the two active vegetable principles, digitalin and strychnine. After moderate doses of these drugs have been taken for some time, it is found that instead of the effects they produce increasing gradually, as we would expect from a gradual accumulation in the blood, the symptoms of poisoning become suddenly developed in somewhat the same way as if the dose had been suddenly increased. It is evident that a diminution in the quantity excreted will produce this effect as rapidly as an increase in the quantity taken, and this is probably the true cause of the phenomenon. When digitalin has been taken for some time and accumulated to a certain extent in the blood, it causes a diminution in the amount of urine excreted, and this diminution is either accompanied or quickly followed by the other symptoms of poisoning."

But the diminution of the urine excreted does not prove defective elimination, nor accumulation in the blood. Were it possible to detect digitalin in the urine, and to determine accurately the time required for its complete elimination, it might possibly be shown that defective excretion is the cause of the cumulative effects. But no one has yet succeeded in finding digitalin in the urine. Dragendorff carefully examined the urine of dogs poisoned with digitalin, but only in a few instances succeeded in detecting a trace of the poison. Recently Dr. W. Van der Heide (*Arch. f. exp. Path. u. Pharm.*, Bd. 19, p. 125) endeavored to extract digitalin from the urine of animals to which he had given large quantities. But the extracts obtained from the urine did not possess the slightest physiological action on the frog's heart. Nor was he able to determine its presence in the blood. When some of the blood of animals which had received digitalin for some time was transfused into healthy animals, no effects due to the poison were observed. He found that tolerance took place in some organs and not in others, when the poison was administered for a long time. He also found that the pulse of a dog became slower after he had eaten large quantities of the liver, heart, kidneys, and muscles of rabbits poisoned by digitalin. Hence he concluded that cumulative action depends upon the peculiarity of the chemical processes which take place in the organs manifesting cumulative effects, in them the compounds of digitalin with the tissues being slowly formed and slowly disintegrated.

From the foregoing, the reader will see that the author considers digitalis the most useful remedy in diseases of the heart with low blood-pressure, especially in valvular diseases and dilated heart, when dropsy and other symptoms of inefficient heart action are present. The reader



will find in the chapter on the action of drugs on the circulation a very full discussion of the mode of action of digitalis in cardiac affections.

Aconite has been much used of late as an antipyretic in consequence of the laudations of Ringer. Brunton also claims that small doses are very useful in a great number of diseases attended by fever. On p. 699 he says that "the heart is quickly affected even by very small doses, and a single drop of the tincture, given in water, twice or thrice at intervals of a quarter of an hour, will in many cases greatly reduce the rate of the pulse." This applies to the British tincture, which is much weaker than that of the U. S. P.

"This slowness of the pulse is due to an action of the aconite upon the vagus roots, and does not occur after the administration of atropine. In some cases of disease also the pulse seems little affected by aconite. In larger doses the vasomotor centre becomes gradually paralyzed, while the heart remains slow, the blood-pressure falls greatly, and the pulse is not only slow, but exceedingly weak and irregular."

Regarding its therapeutic uses, he says on p. 701:

"Its chief use is in the *febrile condition* depending upon local inflammations, such as tonsillitis, sore throat, pleurisy, pneumonia, phthisis, peritonitis, pericarditis, acute rheumatism, gout, erysipelas, otitis, gonorrhœa, and in urethral fever. In many of those conditions small doses of aconite slow the pulse, lower the temperature, and give much relief to the patient."

These very remarkable effects of small doses of the tincture of aconite (B. P.) seem therefore to be due to its action on the vagus roots, in consequence of which the heart's action becomes slow. It does not directly modify oxidation in the organism, for, in experiments, Brunton and Cash found that the active principle aconitine neither retarded nor accelerated oxidation. The composition of the tincture of the U. S. P. differs from that of the B. P., being one to two and a half, while the latter is one to eight. The writer has frequently employed small doses of the tincture of the U. S. P., giving as much as twenty or thirty drops within twenty-four hours, but never noticed any decided effects either on the pulse or temperature. It is very curious that the tincture of aconite should prove so active in the febrile condition, while digitalis is of little use. Both slow the pulse by stimulating the vagi. The reason assigned for the slow action or non-action of digitalis in the febrile state is that the high temperature depresses the vagus nerves so much that they no longer respond to the action of digitalis. It would seem, therefore, that there must exist some peculiar difference between the action of aconite and digitalis on the vagus roots, or that even in small doses aconite greatly depresses the heart or the vasomotor centre.

It is to be regretted that the author has not discussed briefly the general pathology and therapeutics of the inflammatory process. Is it possible to produce any decided change in the circulation of an inflamed part by slowing the heart's action? That this may be accomplished in the earliest stage, when little or no exudation has taken place, seems reasonable; but will it occur when the inflammatory process is fully established? Doubtless a lowering of temperature in febrile diseases may render the patient more comfortable, and all physicians recognize the necessity of antipyretic measures when the heat as such is a source of danger. But aconite can hardly be considered very useful in high fevers, and in safe doses generally exerts very little effect. From the

references in the index of diseases and remedies, it is evident, however, that Brunton supposes aconite to be useful in inflammatory affections by modifying the circulation in the inflamed parts, for under the heads "Peritonitis," "Pleurisy," and "Pneumonia," aconite is followed by the qualifying phrases "In early stage" and "Very useful in commencement."

The author's explanation of the utility of arsenic in phthisis is highly interesting and deserving of the most serious consideration. On p. 98 arsenic is found in the list of substances the action of which on the spores of anthrax bacilli was determined by Koch. The spores were destroyed in ten days by one per cent. solutions in water. On anthrax bacilli a very powerful action was found to be exerted by arsenite of potassium, 1 part in 100,000 retarding and 1 in 10,000 preventing their development.

Arsenic is included in the class of alteratives, which the author defines as "remedies which improve the nutrition of the body without exerting any very perceptible action on individual organs." Regarding their mode of action, it is said, p. 358, "It is uncertain how they act; it is possible that they may alter in some way the action of enzymes in the body, but it is also possible that they act by replacing the normal constituents of the tissues and forming compounds which tend to break up in a different way from those which are ordinarily present." On p. 360 the author says: "Antimony, arsenic, and phosphorus have a special action on tissue change, and powerfully affect the glandular, nervous, respiratory, and cutaneous systems. In large quantities they affect the liver very markedly, producing fatty degeneration; and this also occurs in other tissues." On p. 608 the peculiar action of arsenic on the skin is described and illustrated. It is shown that the protoplasm of the columnar layer of cells in the epidermis of the frog becomes softened, so that the cuticle can be stripped off the whole body with great readiness. "Other epithelial structures are also affected, and Cornil has found fatty degeneration of the epithelium lining the alveoli of the lungs in animals poisoned by arsenic." To avoid repetition, the author has omitted in the article on arsenic any allusion to the experiments of Binz and Schulz, in which it was found that in the presence of protoplasm arsenious acid is oxidized, and arsenic acid reduced. But he includes arsenic in the group of pentad elements, of which it is said on p. 603, "Living protoplasm has the power of oxidizing all the members of this group, and also of reducing the products of their oxidation (Binz)."

Brunton explains the mode of action of arsenic in phthisis as follows:

"It is now probable that this disease depends on the presence of a *bacillus*. In order that it should grow within the body, however, it is necessary that a suitable *nidus* should be present, and the different susceptibility to the disease of different individuals, or of the same individual at different times, probably depends on their liability to present a suitable nidus. The bacillus tuberculosis differs from such bacilli as the bacillus anthracis in being of very slow growth, so that when it is cultivated artificially on a solid medium, it takes about ten days before it succeeds in establishing itself and begins to grow. Consequently when applied to an open wound, or when inhaled into the lungs of a healthy person, it does not, like the *Bacillus anthracis*, at once begin to multiply and produce disease in the organism, but it is usually removed by washing in the case of a wound, or by expectoration in healthy persons. But if its removal be interfered with, it will produce disease. Thus, if instead of being applied

to an open wound it be injected under the skin so that it cannot be removed by washing, it will, after a time, begin to grow, and produce tuberculosis, first local and then general. It is probable that the case is similar in the lungs. In the healthy lung it finds no nidus, and is removed by expectoration, but if a portion of the lung be consolidated by catarrhal pneumonia, the consolidated part probably affords a nidus to the bacillus, and the longer the consolidation lasts the greater the risk of bacilli finding entrance. In croupous pneumonia the exudation into the alveoli, consisting chiefly of fibrin with a few leucocytes, quickly breaks up and is absorbed, so that it is comparatively rarely followed by phthisis. But the proliferated epithelial cells which fill the alveoli of the lung in catarrhal pneumonia are much more resistant; they break down and are absorbed much more slowly, and hence a much longer time is given during which bacilli may find a nidus. The marked hereditary nature of phthisis is a curious point in a disease which we suppose to depend on the presence of a bacillus, and is a character in which it differs from such diseases as anthrax, ague, or relapsing fever, which are also due to foreign organisms. But the difference probably depends on the slow growth of the tubercle bacillus, which renders a prolonged, undisturbed rest at the point where it enters the body necessary for its further growth. *The disease is not hereditary, but the predisposition to such morbid changes in the lungs as afford a nidus to the bacilli is hereditary.*

"The more rapidly the effused products in pneumonia can be removed from the lung, the less chance have the bacilli of finding a nidus. It is probable that arsenic, which causes fatty degeneration of the normal epithelial cells lining the alveoli, also causes a similar degeneration of such cells when filling the alveolar cavities. By thus breaking them up and quickening their absorption, arsenic will lessen the risk of bacilli finding a nidus in them and converting catarrhal consolidation into phthisis."

In connection with the action of arsenic in phthisis, it may be of some interest to ascertain the author's opinion of another remedy which is much used in this disease—*cod-liver oil*. In regard to its use in phthisis, he says:

"In phthisis it is of great service, and is used in all stages of the disease, except when the temperature is very high; especially is it useful in the first stage, where there is little consolidation. Under its use the patient gains flesh, keeps the disease in check, and even sometimes becomes cured."

Every physician who has frequently employed cod-liver oil in cases of phthisis has doubtless observed the remarkable action ascribed to it by Brunton. Some physicians, however, suppose that it acts only as a fatty food, and that other forms of fat may be used as well. That this view is erroneous, may be readily demonstrated by the experiment cited by the author: "If you take two loops of intestine, and fill one with ordinary oil and the other with cod-liver oil, and replace them, the one with cod-liver oil will lose more in the same time than that containing ordinary oil." This proves that cod-liver oil is more easily absorbed than ordinary oil. As to the cause of its ready absorption, there exist two views. According to the older view, which is held by Brunton, cod-liver oil contains biliary matters, which promote absorption. It may be readily seen that oils pass more readily through membranes moistened with bile. But it is somewhat doubtful whether cod-liver oil contains bile, since Buchheim and some other observers failed to find it in careful analyses. But even if present, the quantity is so minute that no very decided difference could result therefrom in the behavior of the oil. According to the other, and more recent view, cod-liver oil contains a notable quantity of fatty acids, especially oleic and palmitic. These acids,



coming in contact with alkaline substances in the intestine, form soaps, and thus emulsify the oil, breaking it up into exceedingly minute drops, which are quickly absorbed. That such a fine emulsion is formed when cod-liver oil comes in contact with alkaline liquids, is readily observed in the following experiment: Put a small quantity of a dilute solution of caustic soda (3-1000) into a watch-glass or test-tube; add one or two drops of cod-liver oil. In a few moments a milky liquid appears, which, under the microscope, is seen to consist of minute drops of the oil (Ewald).

It is unnecessary to allude to other remedies in order to exhibit the character of this work. From the quotations, the reader will doubtless have concluded that it is not only profoundly scientific, but thoroughly practical. Indeed, every chapter teems with matter of the greatest practical importance. For the most part, the practical application of drugs is based on their ascertained physiological action; but where scientific research has failed to elucidate the mode of action of remedies, full justice is done to the empirical observations by which nearly all the uses of medicines were discovered. Having carefully examined the work, we think we may justly say that the student will find it a thorough and trustworthy text-book; the practitioner a guide which contains all the real therapeutic information gained by empirical and scientific methods; and the pharmacologist such a masterly exposition of the methods of investigation that he will consult its lucid pages on all occasions.

S. N.

A PRACTICAL TREATISE ON URINARY AND RENAL DISEASES, INCLUDING URINARY DEPOSITS. Illustrated by numerous cases and engravings. By WILLIAM ROBERTS, M.D., F.R.S., F.R.C.P. Lond., Professor of Medicine at the Victoria University, Consulting Physician to the Manchester Royal Infirmary, assisted by ROBERT MAGUIRE, M.D. Lond., M.R.C.P. Lond., and Physician to Outpatients, St. Mary's Hospital, London. 8vo. pp. 609. London: Smith, Elder & Co. Philadelphia: Lea Brothers & Co., 1885.

THE appearance of a new edition of Dr. Roberts's well-known and valuable work is an event which will be hailed with pleasure by all who are familiar with the last edition, which has been for some time out of print. From want of leisure, Dr. Roberts has intrusted its revision to Dr. Maguire, who has sought to bring the various articles up to the level of our existing knowledge, while Dr. Roberts himself has almost entirely rewritten those on albuminuria and microorganisms. It is to the former that one probably first turns, for all are naturally anxious to ascertain the views of so mature an observer, and so busy a physician, on so practical a subject. We are met at the outset with the statement that the best tests for albumen are coagulation by boiling and nitric acid. This statement Dr. Roberts makes after having thoroughly examined the recently suggested delicate tests, sodium tungstate, mercuric iodide, acidulated brine, and ferrocyanide of potassium. He believes that the most frequent source of fallacy in their use is not peptone or hemialbumose, but mucin, which, he says, they all throw down in a manner indistinguish-



able, without further testing, from albumen. When the contact method is followed, they yield, if the urine contain mucin, an opalescent zone at the juncture of the two fluids, and they yield exactly the same reactions if the urine contain albumen. For such reasons as these he concludes that we must, for the present, abide by the old tests. Dr. Roberts does not even mention, as a test for albumen, picric acid, so highly valued by Dr. Johnson, and which is claimed by the latter to be free from the objection made to all others as to the precipitation of mucin. It is but fair to state, however, that in this view Dr. Johnson is not sustained by all other observers.

We believe, on the whole, that Dr. Roberts is right in thus giving these tests a second place, for although three of them are more delicate than heat and nitric acid, both for the reason mentioned, and the additional one that they precipitate also the alkaloids, they are not so reliable without precautions which are likely to be overlooked.

We do not think that Dr. Roberts lays sufficient stress upon the fact that uric acid also reduces the sulphate of copper, and therefore may become a source of error in testing for sugar. It is true, as he says, that practically it is very rare that this happens; yet we have known both chemist and physician to be misled by this reaction, and what has occurred once may occur again.

The part undertaken by Dr. Maguire has been well performed. He has in the main succeeded in bringing the various sections to the present state of our knowledge, while the individuality of the book, as Dr. Roberts's production, is not destroyed. Maintaining, as it does, the merits of previous editions, with those improvements demanded by more recent accessions to our knowledge, we predict for the volume the success of its predecessors.

J. T.

MINOR SURGICAL GYNECOLOGY. A TREATISE OF UTERINE DIAGNOSIS AND THE LESSER TECHNICALITIES OF GYNECOLOGICAL PRACTICE, INCLUDING GENERAL RULES FOR GYNECOLOGICAL OPERATIONS, AND THE OPERATIONS FOR LACERATED CERVIX AND PERINEUM AND PROLAPSUS OF UTERUS AND VAGINA. FOR THE USE OF THE ADVANCED STUDENT AND GENERAL PRACTITIONER. By PAUL F. MUNDÉ, M.D., Professor of Gynecology at the New York Polyclinic and at Dartmouth College, etc. Second edition, revised and enlarged. 8vo. pp. 552. New York: William Wood & Co., 1885. London: Cassell & Co., Limited, 1885.

IN reviewing any work, great or small, two considerations should be kept before the mind. The first is the design of the work, or the object with which it has been written; the second is the manner, skill, and ability with which the design has been carried out. It is upon these that the whole value of the work depends. The design may be so great and noble as to raise the importance of the mode of execution to the highest; the grander the design, the greater the difficulty of carrying it out. On the other hand, the design may be so mean, mistaken, and faulty as to render the manner in which it has been executed of no importance; no skill can render it beautiful, and no ability can give it worth.

The work before us is intended "for the use of the advanced student and general practitioner." It treats of minor gynecology, and the author states the "particular object" of the book to be "to supply the details of gynecological technique and practice." Not having the time and strength at his command to write a complete work on operative gynecology, he says: "I have chosen, for the present, several minor operations which are now agitating the professional mind more particularly, and which bid fair to become universally popular, leaving for a future time the preparation of a complete work."

In discussing such a design, the first thing that demands a passing glance is the present state of that department of the science of medicine called gynecology. This is essential; the existence of such a design *should* depend upon it. The first thing, and one of the most remarkable to be observed in this department of medicine, is the extreme divergence of the views held by authorities with regard to the pathology and treatment of the diseases of women; this divergence is not the least marked in those subjects of which the work before us treats.

Some years ago inflammation of the cervix of the uterus was supposed to be the great cause of female suffering; this supposition was acted upon, and a countless number of cervixes were burnt off by means of caustics. This was the doctrine of the so-called "inflammatory school." Its first and chief exponent in England is still living. We shall make no further reference to this school. Then came the "mechanical school," whose great doctrine was that displacements, versions, and flexions of the uterus were the main factors in uterine pathology. This school threatened at one time to become universal; the simplicity and plausibility of its teaching, and the ease with which the morbid condition could be diagnosticated, paved the way for its general reception. Latterly, however, it has come upon troubled times, and has received injuries from which, although it manifests considerable vigor, it will not recover. Another school has risen within the last few years, and has rapidly gained adherents, more especially in America. This school places laceration of the cervix uteri in the position given to "inflammation of the cervix" and displacements by the inflammatory and mechanical schools respectively. The rapidity of the growth of this school in America reminds us of the growth of a certain gourd; whether it is destined to wither by like means is not yet manifest.

There is another school of gynecology which accepts none of the principal tenets of the above mentioned schools. Its adherents are not numerous among the special practitioners of gynecology, but they have never hesitated to maintain the correctness of their views. This school is sceptical or rational, and it holds no views or tenets which have not been established by anatomical, pathological, or clinical facts. It is not surprising then that the actual knowledge professed by its adherents should be small, their positive dogmas few, but their negations many. Its adherents are in the main the hard workers, who doubt and test the general and often sweeping assertions of the great authorities of the other schools to find them too often, alas, but inverted pyramids. The only good which has resulted from most of the speculations of the mechanical and laceratory schools has been to give occupation to diligent, scientific inquirers, who by careful study and research, carried on for years, have succeeded in establishing certain propositions on grounds

which are not to be shaken, while the mischief which has been done by them, especially by the mechanical school, is a part of the unknown.

Dr. Mundé's book is divided into three parts. The first treats fully of the manner of conducting an examination (verbal and physical) of a case, with a description of the instruments used in such examination. The second part treats of "minor gynecological manipulations and applications." In this part are described "catheterization," dilatation of the urethra, injections into the bladder, applications to the vagina, cervix, and endometrium, "tamponade of the vagina;" dilatation of the uterus by means of tents, bougies, dilators, knives, etc.; curetting of the uterus, reposition of the uterus and ovaries; pessaries and their introduction, etc.

The third part discusses gynecological operations, mainly, however, the operations for laceration of the cervix and of the perineum, and for prolapse of the uterus and the vagina.

The work is a mixed product, an emanation from two schools—the mechanical and laceratory. It is not tainted with any of the tenets or attributes of the sceptical school. On the contrary, it is characterized by implicit confidence and undoubting faith in the theories and the methods of treatment of the two schools mentioned—as undoubting indeed as if the author were entirely ignorant of the work which has been done during recent years—work which has set at rest the position of displacements in uterine pathology. No such work has as yet been done for the laceratory school, and until such work has been accomplished, the existence of that school must be an extremely uncertain one. The disciples of both these schools—the mechanical and laceratory—are faithful to their convictions whatever may be their attitude toward facts. The sum of the evidence in favor of the mechanical theory of uterine pathology consists of the following: convictions from clinical observation—whatever that may mean; the recognition of the association of displacements with suffering, and the non-recognition of absence of displacement with equal suffering, and of displacement with no suffering; the theory that flexion of the uterus causes stenosis of the canal, obstruction to the flow of the menses, and dilatation of the cavity of the body of the uterus; the inference that flexion causes pressure on the tissues of the uterus, and prevents the return of blood from the organ, and therefore gives rise to congestion and enlargement of its body; the theory that dysmenorrhœa is due to obstruction, and that that obstruction is due to stenosis of the inner or outer orifice or to flexion.

Now it is an astonishing fact, that in support of all or any of these theories, no evidence amounting to anything like proof has ever been produced; while, on the other hand, several of them have been proved to be absolutely false. Conviction alone from whatever experience, has no place in science, unless the process by which the conviction is arrived at is given. The association of suffering with displacements of the uterus is recognized by all schools, but this is no proof or even evidence in itself of a causal relation between them. The fact that no causal relation exists between displacement and suffering has, however, been established beyond doubt. Vedeler and Herman have shown that suffering is just as frequent in the absence as in the presence of flexion, and further, that flexion is present as often without as with suffering.

No evidence, whatever, is forthcoming in favor of the statement that flexion of the uterus causes stenosis of the canal; while every flexed uterus examined post-mortem has demonstrated the contrary, and, with



equal relentlessness shown that flexion does not give rise to dilatation of the canal above the angle of flexion; and Williams has shown that the circulation in the uterus is such that it is not possible for flexion of the organ to interfere with it. Thus by years of scientific labor and research it has been abundantly demonstrated that not one of the pathological convictions to which the mechanicians are so faithful has any basis in fact; and that all these convictions are the emanations of a too fervid fancy unfettered by a rigid regard for facts.

But let us proceed to another tenet of the mechanical school, which has called into existence much of so-called minor gynecology. Marion Sims started with the theory that dysmenorrhœa could not exist without stenosis of the uterine canal. This he treated as an axiom—a self-evident truth. Not finding the condition generally at the external os, he inferred it must be at the internal, acted accordingly, and invented a knife for division of the uterine wall at that part.

But what are the facts? Is not stenosis of the uterine canal at the inner or the outer orifice extremely rare, while dysmenorrhœa is extremely common? It is well known that if a Simpson's sound can pass along the uterine canal there can be no stenosis. It is also true that there are many cases in which it is difficult to cause the sound to enter the os internum; but this is due, not to stenosis of that part, but to imperfect manipulation, for once the sound has entered the cavity of the body, there is no difficulty in withdrawing it, the instrument is not grasped in the supposed narrow os. The same is true with regard to the os externum. Cases of conical cervix with small round external os are not uncommon, but it is extremely rare that such an os is so small as not to permit the entrance of a Simpson's sound. Pinhole os is a misnomer for this condition, and is infinitely rare. If the os be large enough to admit the sound, it is surely large enough to permit the flow of the menses and the entrance of the microscopic spermatozoa, for they readily penetrate the smaller lumen of the Fallopian tube. The theory that such conditions cause dysmenorrhœa or entail sterility would be too absurd for refutation, but for the fact that great names have endorsed it. There is no statistical evidence, but only general assertion, in favor of it, while every gynecologist has had evidence of its incorrectness in the fact that women with so-called "pinhole os" and conical cervix menstruate without pain and become mothers. The evidence at present before us shows that the mechanical system of uterine pathology has no claim to be regarded as a part of scientific medicine. The space at our disposal does not permit us to do more than point out the fallacies of this school, and we must, consequently, omit to point out the trouble and injury it entails upon women.

We come now to the third part. This treats of laceration of the cervix, of the perineum, etc. It differs from the second in the following respect: It not only describes the operations proposed and performed for these conditions, but it also discusses more or less fully the lesions themselves, their causes, symptoms, effects, etc. We find it stated that laceration of the cervix is a "prime factor" in the production of uterine disease, and that the operation for its cure "has become almost fashionable," and that "the significance of cervical laceration as a factor of uterine disease is now universally accepted by advanced gynecologists all over the world." We find, however, that "advanced gynecologists



all over the world," consist of some Americans, a writer of a thesis in France, and a few gynecologists in Germany, and one or two in England.

The evil effects of laceration of the cervix are summed up as follows: Subinvolution of the uterus, cervical and corporeal endometritis, papillary and cystic hyperplasia of the cervix, uterine fungosities, uterine displacements, chronic periuterine cellulitis and peritonitis, neuralgia of cervix, chronic ovaritis, and epithelioma, and two other conditions, namely, "the incapacity for conception, or absolute sterility, and its converse, the tendency to abortion or virtual sterility."

Laceration of the cervix, it is true, may be present with any of these conditions, but this is no proof that it is the cause of them. Every one of the above assertions is made without the semblance of proof. Every one of the above conditions, with the exception of the first and last, may be present in the virgin or nulliparous woman, and each of them may be the result of other causes than tears of the neck of the womb. Moreover, in ascribing them to tears of the cervix brought about during labor, all the profound and complex effects of pregnancy and labor, with the exception of the mechanical tear, are ignored—effects to which full weight must be given before a true pathology of the conditions in question can be arrived at.

The assertions above referred to, based on the flimsiest evidence, are to be greatly deprecated, for they are calculated to retard the progress of scientific gynecology, and will demand years of labor to give them their proper value, just as the assertions of the mechanical school have required years of work to establish their specious character.

The book places in the hands of the student and practitioner weapons which may be, and daily are productive of the gravest injury without giving the knowledge when to use them. The great difficulty is not *how* to operate but *when*, and a work such as the one before us is calculated not to inculcate good and sound practice, but to encourage meddling treatment and unnecessary operations. Illustrations of this statement abound in its pages, but let the following suffice:

"By the persistent application to the vaginal roof and cervix once or twice a week for several months, of these agents, chiefly the pure tincture of iodine, I have seen most decided diminution in the size of the hyperplastic uterus, with marked amelioration of the various distressing hystero-neuroses so characteristic of this affection, and gradual softening and absorption of the exudation in not too old cases of pelvic peritonitis and cellulitis."

The course of these disorders is tolerably well known, and the practice here inculcated is on a par with the practice of introducing a pessary and paying a visit to it on alternate days—both are as unnecessary as they are mischievous and degrading.

The design of the book is bad; it shows an entire want of appreciation of the needs of the student and practitioner in gynecology. Under these circumstances we do not deem it necessary to notice the manner in which the design has been carried out.

TRANSACTIONS OF THE AMERICAN OTOLOGICAL SOCIETY. Eighteenth Annual Meeting. 8vo. pp. 520. New Bedford, Mass.

Dr. Charles H. Burnett, of Philadelphia, reports his experience in *The local use of cocaine and brucine in diseases of the ear*. He has not found much benefit from cocaine when there was violent inflammatory pain, or been able to produce sufficient local anæsthesia in the auditory canal by its use, to permit painless incision of the skin. A limited experience with brucine has been more satisfactory, and Dr. Burnett thinks it will be found particularly useful as an application to the skin of the meatus.

Dr. E. Eugene Holt, of Portland, Me., in answer to the question *Does cocaine hydrochlorate, while relieving the pain in acute otitis media, prolong the congestion?* states his belief that "while it relieves the pain when used early and repeatedly, it, at the same time, holds the inflammation, as it were, in check, which, when the effects of the drug subside, goes on in a more or less passive state, now and then lighting up anew, with twinging pains, keeping the mucous membrane in a congested, swollen condition." The general impression of the Society seemed to be that the effect of cocaine is superficial, and the relief of pain by its use only partial and temporary.

Dr. H. Knapp, of New York, in some remarks *On the desirability of adopting a uniform method of expressing the results of testing the acuteness of hearing*, maintains that Politzer's hammer has no advantage, as an acuometer, over the watch, which, with the voice, gives a sufficient test in a great majority of cases. He proposes to denote the different degrees of hardness of hearing, as tested by the watch and voice, by Dr. Prout's method of expressing them as fractions of the normal standard, as oculists express degrees of impairment of sight, and suggests the adoption of a uniform system of symbols to be used in recording.

Dr. Samuel Sexton, of New York, reports *Two cases of neglected ear disease in infants resulting in death*. The patients, in both cases, were about seven months old. There was no post-mortem examination in the first case, but the symptoms pointed to meningitis. In the second case, post-mortem examination showed purulent meningitis, with extensive disease of the temporal bone. The inflammation seemed to have extended from the tympanum underneath the auditory plate into the antrum, and a sinus afforded communication between the antrum and an abscess beneath the periosteum. The author calls attention to the fact that in young children the danger does not lie in an invasion of the mastoid, which is in a rudimentary state, but in an extension of the inflammatory process to the antrum.

Dr. O. D. Pomeroy, of New York, reports *A fatal case of suppurative otitis media, with abscess of the cerebellum, necrosis and caries of the petrous portion and hyperostosis of the roof of the tympanum*. The patient was thirty-eight years of age, and the ear had been suppurating since early childhood. The increase and extension of the inflammation were probably due to an injury to the side of the head.

Dr. Samuel Sexton, of New York, contributes a paper on *Inflammation of the attic of the tympanum*, which he thinks has not received the attention that its importance demands. He believes that this affection

frequently arises independently of the antrum, and that the membrana tympani may not be greatly, or at all, affected. "Chronic inflammation of the attic presents itself frequently in the form of a deep sinus, containing sometimes either pultaceous matter or inspissated pus, sometimes polypoid tissue or epithelial crusts, leading through the membrana flaccida, or inner extremity of the external auditory canal up into the attic, and frequently from that point into the antrum." Sometimes the membrana flaccida and ossicula are absent, while in other cases they remain, and, by thickening of the tissues, obstruct drainage of the discharge from the attic. These chronic processes may last for years, or even through a long lifetime. Acute inflammation may extend from the antrum to the attic, or both may be affected simultaneously, but the author believes that the attic is often involved alone. He considers inflammation of the attic more serious than that of the antrum, because swelling of the mucous membrane may close the outlets of the discharge, and there is special danger of extension of the disease to the cranial cavity. When pent-up discharge cannot be evacuated by puncture of the membrana flaccida, it is recommended to perforate the posterior wall of the external auditory canal.

In a paper on *The relation between chronic otitis media catarrhalis and chronic rhinitis*, Dr. Chas. H. Burnett, of Philadelphia, claims that non-suppurative chronic catarrh of the middle ear is invariably associated with some form of chronic rhinitis, usually the hypertrophic form; he considers this complication much more important than pharyngeal affections as a causative element in the aural disease, and maintains that local treatment should be directed chiefly to the nares.

Dr. W. W. Seely, of Cincinnati, advocates the application of yellow oxide of mercury in vaseline to the nasopharyngeal spaces in *The treatment of chronic otitis media*.

Dr. Chas. J. Kipp, of Newark, N. J., reports a *Case of fatal ear disease beginning as a circumscribed inflammation in the outer half of the external auditory canal*. The tympanum was never seriously involved at any stage of the disease. Post-mortem examination showed extensive purulent meningitis, and a small abscess in the cerebellum on the side of the affected ear. The mastoid cells were filled with pus.

Dr. E. Eugene Holt, of Portland, Me., reports *The present condition of the patient from whom teratoid tumors of both auricles were removed in 1883, and reported to this Society the same year*. For nearly a year there was but little indication of recurrence. At the end of that time the edges of the auricles commenced to thicken and there are now well-formed tumors.

Dr. D. B. St. John Roosa, of New York, proposes the term *Presbykousis* for the impairment of hearing in old age, due to senile changes without disease. He maintains that this condition can readily be distinguished from the deafness resulting from chronic proliferating processes in the tympanum and Eustachian tube. The subjects of presbykousis hear the tuning-fork better through the air than by conduction through the bone, which is not usually the case when there are pathological changes in the middle ear. The human voice is heard relatively much better than the tick of a watch, and hearing for conversation may be almost perfect in a quiet place, though much disturbed by surrounding noises. Dr. Roosa thinks that this form of impairment of hearing is due chiefly to a lessening of the perceptive power of the acoustic nerve,



though there are probably other causes, as senile rigidity of all the tympanic structures.

A case of *acute otitis media suppurativa, followed by mastoid disease and pyæmia; mastoid operation; recovery*, is reported by Dr. Graham Bacon, of New York. The attack commenced with earache, followed in three days with discharge, which continued profuse. Three weeks afterward there were tenderness and redness over the mastoid, and a Wild's incision was made, with temporary relief. A few days later there were nausea, vertigo, and chill. The mastoid process was opened with drills, and two drachms of pus were evacuated. Two weeks afterward there was cough with mucopurulent expectoration, preceded by chill. A few days later there were repeated chills, and abscesses formed near the ankle-joint, in the thigh, in the leg, on the arm, and in the neck. The patient eventually completely regained his health. The author believes that in many cases of this kind the aural disease is periosteal from the beginning.

Dr. E. Dyer, of Newport, R. I., reports a case of *Fistula auris*. A fistulous opening had existed in the tragus of a girl, fourteen years of age, since birth. There was frequently an offensive discharge from the opening. The sac was destroyed by galvanic cautery.

Dr. Samuel Sexton, of New York, describes a *Binaural conversation tube for the instruction of the deaf*. An additional mouth-piece is attached to enable the person using it to hear his own voice.

Professor A. Graham Bell, of Washington, D. C., in some remarks *On the possibility of educating the hearing of deaf-mutes*, calls attention to the fact that a large proportion of the so-called deaf-mutes in our institutions are only hard of hearing; this proportion being especially large among the congenitally deaf. It has been found that children born with partial hearing, but not enough to enable them to acquire speech by imitation, can, by means of artificial aids to hearing, be taught to speak, and, when so taught, are only hard of hearing. In the Nebraska Institution for Deaf-mutes, fifteen per cent. of the pupils are graduated as hard-of-hearing speaking people, and not as deaf-mutes, and the Principal thinks that twenty-five per cent. have sufficient hearing to be made useful.

A very full and carefully prepared *Alphabetical index of otological literature, from July, 1884, to July, 1885*, compiled by Dr. Graham Bacon, of New York, and Dr. Francis H. Brown, of Boston, closes the volume.  
G. C. H.

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TEXT-BOOK OF OPHTHALMOSCOPY. By EDWARD G. LORING, M.D. PART I.  
THE NORMAL EYE, DETERMINATION OF REFRACTION, DISEASES OF THE MEDIA, PHYSIOLOGICAL OPTICS, AND THEORY OF THE OPHTHALMOSCOPE.  
8vo. pp. iv., 274. New York: D. Appleton & Co. London: Cassell & Co., Limited, 1886.

THE connection of its author's name with a most popular and excellent form of refraction ophthalmoscope adds to the interest felt in this long-promised work; which seems, on the whole, to be the best exposition of its subject that has so far appeared in medical literature.



Disregarding the traditional forms of bookmakers, Dr. Loring enters directly upon the consideration of his subject, without dedication, preface, or formal introduction. Omitting the customary "reasons which led the author to prepare," etc.; his work is left to stand on the general *raison d'être* for any new medical book, viz., that it presents the facts dealt with more briefly, clearly, correctly, or completely than previous treatises.

This book shows the effect of deliberate preparation. A general characteristic is the thorough incorporation of its matter in one harmonious whole. It is no literary patchwork, but a carefully woven fabric of fairly uniform excellence. It contains but few needless repetitions; no sudden interruptions of the train of thought; no accumulations of contradictory and confusing statements beneath which an author's real belief, or absence of belief, is so often buried. For instance of the latter: after giving the various theories to account for the light-streak on the retinal vessels, propounded by Van Trigt, Jäger, Schneller, and himself, the author sets forth clearly the real state of our knowledge by this judicial summing up: "It will be seen then, from these various opinions, that no thoroughly satisfactory and acceptable explanation of the presence of the light-streak on the centre of the retinal vessels has as yet been given."

The book opens with general remarks and descriptions of methods. Then follows a chapter on the anatomy of the fundus, in so far as it determines ophthalmoscopic appearances. Then these appearances in the normal eye are described. Chapter V., on "The Determination of the Optical Condition of the Eye with the Ophthalmoscope," has been before the profession some ten years in the form of "advanced sheets." Among the slight additions that have been made to it, is a table for calculating the shortening or extension of the optic axis in H. or M.; and in the explanation of this table we note this error. "In a second case the border of the nerve and general fundus is myopic 1.5 D., the bottom of the excavation is myopic 4 D., the true extent of the excavation will be 4 D.—1.5 D.=2.5 D.; M. 2.5 D.=0.76 mm." Of course, to get the real difference between the two planes both should be first referred to the plane of emmetropia, and the difference of their values in millimetres obtained thus: M. 4 D.=1.28 mm., M. 1.5 D.=0.45 mm.; 1.28 mm.—0.45 mm.=0.83 mm., the real depth of the excavation. The last chapter deals with the examination of the normal and abnormal media. It gives a good account of the results obtained by "oblique illumination," illustrating how these must supplement and interpret ophthalmoscopic appearances.

Finally, an appendix of over sixty pages sets forth the optical principles involved, and the theory of the ophthalmoscope. To this the beginner should first turn, for broadened and made easy as it may be, a clear understanding of these principles remains the only true door to the ophthalmic fold.

It is usually unfair to criticise a book for its omissions; and this might be specially urged for one, of which only the first part is before us, without even a schedule to show what may be expected of other parts. Still, attention must be called to the utter ignoring of retinoscopy as a practical method for the measurement of refraction. Reference is made to Bowman's classical note (Donders, 1864) and Couper's proposed method

(*Trans. Fourth International Congress, 1872*), and then the subject is thus dismissed :

"Since Mr. Bowman's article (*sic*) others have taken the matter up and produced many and voluminous essays upon the subject of determination of refraction with the mirror alone, under the titles of "Keratotomy," "Pupillotomy," and "Retinoscopy." It still means, however, in my opinion, the most difficult and least satisfactory of any of the methods of determining the refraction of the eye, and contributes nothing which cannot be more easily and more expeditiously performed by the upright image. I would refer the curious, however, and those fond of optical problems for their own sake, to papers on the subject by," etc.

This is much as though, in a systematic treatise on operative surgery, we should read of general anæsthesia: "The ancients were accustomed to administer large doses of narcotics to those about to undergo severe surgical operations; and about the beginning of this century Sir Humphry Davy made some remarkable observations with reference to the effects of nitrous oxide. Since that time a good deal has been written on the subject under the titles of Etherization, Chloroformization, and Anæsthesia, for which the curious are referred to." etc. The supposititious case only seems more absurd, because all are familiar with anæsthesia, while, as regards retinoscopy, many ophthalmologists in this country have not yet mastered it; and in their ignorance of its advantages would doubtless echo Dr. Loring's opinion. But the procedure, especially with the plane mirror, has demonstrated its claim to the attention of every one who undertakes to diagnose accurately errors, of refraction, and ere long that claim will be universally admitted.

Another matter for regret is, that our author should only mention the forms of ophthalmoscope he has himself devised. "Not," he explains, "because they are in any way better than others, but simply because he is better acquainted with their qualities good and bad." Still, it is to be presumed that he is much better acquainted with the qualities, good and bad, of the "thousand varieties, by as many inventors," of this important instrument than most of his readers can be; and some comment upon the more popular and valuable forms was not too much to expect from a work of this character. At least some general discussion of focal lengths for concave mirrors, size of aperture, series and succession of lenses, would have been valuable; if it only served to narrow the limits of useless invention and modification.

The paper, printing, and proof-reading are excellent. The book is well illustrated with woodcuts and diagrams. It has also a few colored plates which compare favorably with anything of the kind we have heretofore seen, but which still forcibly remind us that while the forms of the fundus may be accurately shown, the exact reproduction of its myriad hues and shades of color still baffles the printer's skill. As a whole, the book is well written, comparatively free from awkward or obscure expressions, and contains much of interest to the most advanced student (that is, the most experienced practitioner) of ophthalmoscopy, yet it can be readily followed by the tyro. It will be well worth its price to him who learns from it but the truth of this one sentence: "Five-sixths of the art of ophthalmoscopy are contained in a knowledge of the normal eye, the rest is a series of representations which can be read almost at sight."

E. J.

A TREATISE ON THE DISEASES OF INFANCY AND CHILDHOOD. By J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children in Bellevue Hospital Medical College, New York; Consulting Physician to the New York Infant Asylum, etc. Sixth edition, thoroughly revised. 8vo. pp. 867. With forty illustrations. Philadelphia: Lea Brothers & Co. London: H. K. Lewis, 1886.

RARELY does a pleasanter task fall to the lot of the bibliographer than to announce the appearance of a new edition of a medical classic like Prof. J. Lewis Smith's *Treatise on the Diseases of Infancy and Childhood*. For years it has stood high in the esteem and confidence of the profession, and with the additions and alterations now made it may be truthfully said to be the best book in any language upon the subject of which it treats.

An examination of the text fully sustains the claims made in the preface that, "in preparing the sixth edition, the author has revised the text to such an extent that a considerable part of the book may be considered new." The fact that such extensive revision was necessary in order to keep Dr. Smith's book abreast of current pediatric literature, is the best possible proof of the rapid advancement made during the past few years in this department of medicine. One new section has been added, in which the following diseases of the genito-urinary organs are discussed: Uric acid infarctions, enuresis, calculi, dysuria, cryptorchia, and vulvitis.

While nearly every page bears evidence of careful and intelligent revision, a considerable number of the chapters have been entirely rewritten; among the latter, we would call especial attention to the chapters on infant feeding, scarlet fever, pseudo-membranous croup, and infantile diarrhoea.

The article on scarlatina is an exhaustive monograph of sixty-eight pages, in which is discussed with minuteness every phase of the disease. It is, however, but fair to state that it is almost a literal reproduction of the article on scarlatina contributed by the author to "The System of Practical Medicine by American Authors."

In conclusion, if the young practitioner proposes to place in his library but one book on the diseases of children, we would unhesitatingly say, let that book be the one which is the subject of this notice.

W. J. C.

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A COMPLETE PRONOUNCING MEDICAL DICTIONARY. By JOSEPH THOMAS, M.D., LL.D. Royal 8vo. pp. 844. Philadelphia: J. B. Lippincott Company. London: Cassell & Co., Limited, 1886.

THE aim of this handsomely printed volume is to furnish aid especially to those who are beginning the study of medicine and its allied sciences. Its author, therefore, has thought it necessary to devote much care to the etymology of words, as essential to a correct understanding of their exact meaning, and as an aid to the memory of the student. In



this we think he is right, and are sure that the majority both of lexicographers and ordinary readers will admit the correctness of his views.

Our author, also, has thought it wise to include literal translations of ordinary anatomical terms as parts of his definitions. This bringing a book down to the comprehension of the ignorant is not in accordance with our views, either upon literary or utilitarian grounds. But whether we are right in this opinion or not, there can be no question that such a course involves the author in much difficulty, by leading him to think that a mere translation is the equivalent of a definition. Thus we turn to the sample cited in the preface, *extensor digitorum communis*, and we are told that it is "the common extensor of the fingers. A muscle of the forearm, the tendons of which are inserted into the phalanges of all the fingers, which it extends." But certainly such a definition is of little use. Apart from the fact that an opportunity to convey etymological instruction is lost, by calling the digits fingers, in what purports to be a literal translation, the veriest tyro in anatomy must know that the muscle in question is in the forearm, and that as it is an extensor, it is quite likely to extend something. It would certainly be more to the purpose to give the precise origin, the peculiar insertions, and the exact location of the muscle. If we are to have anatomy taught in a dictionary, it should by all means be precise and helpful anatomy, rather than such superficial statements as the above. But Dr. Thomas has whetted our curiosity, and we look for the name of a little muscle which has been preserved in our memory by the rhythm and melody of its Latin name, the *levator labii superioris alaeque nasi*. That little muscle, playing an important part in our times of joy and sadness, is certainly entitled to a place in a complete dictionary; but we look in vain, its treasured name does not appear. Certainly Dr. Thomas must have used that muscle many, very many times, unless he is the most impassive of lexicographers, and yet he passes it by unmentioned. Oh, Dr. Thomas! to undertake to tell beginners in anatomy the names of things and their meanings, and to consign to oblivion the name of that dear little muscle which so manfully bears its part in every emotion of their lives.

As would be expected from the author of what is specifically styled a pronouncing dictionary, Dr. Thomas has paid great attention to the pronunciation of words, and with true lexicographer's zeal he lays down the rules by which he has been governed in this matter. It would not be interesting to our readers to go into these rules in detail. For that we must refer them to the book itself, and to its well written and modest preface. Suffice it to say, that we see no reason to differ from our author either in his rules, or with his practical exposition of them in the body of the work, so far as we have examined.

Recognizing the vast importance of botany to the materia medica, very many botanical terms are included in this dictionary, and in this respect no one will be inclined to dispute its author's wisdom, or to question his assertion that the physician should seek to become acquainted with nature in the widest sense of the term, more especially with a department of science which bears so largely upon the healing art.

A notable feature in the volume is the insertion of an encyclopædic article ten pages long, on Pathogenesis, by Dr. Morris Longstreth. While we fail to see the propriety of putting such an article in such a book, the paper itself is worthy of high commendation. In it the older and more recent germ theories of disease are discussed with sufficient



fulness and much precision. The part borne by different investigators toward the elucidation of the germ theory is well told, and Dr. Longstreth's conclusions are wisely moderate. The subject is brought down to a late date, and is well summarized in a way which is not only suitable for beginners in the study of medicine, but in one which will convey information satisfactorily to many whose lives have been devoted to it. We well understand the desire of the author to secure so able and scholarly a paper for his book, but we do not see that, important as the topic confessedly is, that it is sufficiently so to warrant the occupation of so large a space with its discussion in a dictionary for beginners. We also confess to some surprise that Dr. Longstreth should have been willing to bury so excellent a paper in such a way.

It is, of course, easy to criticise the presence or absence of particular words in almost any dictionary, for in the most perfect there will be errors both of commission and omission. We do not, therefore, propose to submit Dr. Thomas's to an elaborate analysis of this kind, but will content ourselves with the narration of a special experience. As this review was being written, a beginner in medicine asked us the meaning of the term Cheyne-Stokes respiration. Distrusting our own powers of definition, we turned over the pages of the dictionary for an accurate explanation of the term, but we were unable to find it or any definition of it.

But we have said enough to make quite clear the estimate we are disposed to place upon this volume. Being written for beginners, it is in a measure exempt from the severe criticism to which it might otherwise be fairly subjected. We have only to say that even the beginner will very likely be disappointed as he seeks for information in its pages upon technical subjects, and that so soon as he ceases to be a beginner, that is after two or three weeks' study, he will do well to get another dictionary.

S. A.

#### HEALTH REPORTS.

FOURTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF NEW HAMPSHIRE, FOR THE YEAR ENDING APRIL 30, 1885. Pp. 317. Concord: 1885.

SEVENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF RHODE ISLAND, FOR 1885. Including Report on Births, Marriages, and Deaths in 1883. Pamphlet, pp. 409. Providence: 1885.

THIRD BIENNIAL REPORT OF THE STATE BOARD OF HEALTH OF IOWA, FOR THE FISCAL YEAR ENDING JUNE 30, 1885. Pp. 584. Des Moines: 1885.

FROM the general report of NEW HAMPSHIRE, it appears that the State has not been visited by any epidemic during the past year, although the usual apprehension was felt in regard to the advent of cholera, happily as yet proved to be needless. The numerous reports from towns indicate a moderate prevalence of typhoid fever and diphtheria, and in many instances the origin or increased virulence of these filth diseases was duly traced to contamination of the water supply, particularly by sewage. Smallpox is not mentioned among the twenty prominent causes

of death, so that no epidemic of variola has occurred, a favorable record which we hope that rigid quarantine and careful vaccination will enable the sanitary authorities to duplicate next year, notwithstanding the threatened invasion of this loathsome malady from the plague-stricken Canadian provinces.

Beside an excellent digest of the proceedings at the last meeting of the American Public Health Association, Dr. G. P. Conn, of Concord, President of the Board, contributes a valuable essay upon the "Milk Supply of Large Towns and Cities," in which the vital importance of due attention to the health of cows is insisted on. Dr. William Child, of New Hampton, endeavors, in an article upon "Country-homes—their Sanitary Condition," to popularize the important truth, that contaminated drinking water may not only disseminate the germs of cholera and typhoid fever, but tends to reduce the vitality, and impair the physical and mental qualities of those employing it as a beverage. A well-written paper, condensed from the thesis presented by W. E. Angier, of West Swanzey, gives "Some of the Practical Results of Sanitary Engineering," and the instructive dissertations of Prof. R. C. Kedzie, of Michigan, on "Drainage for Health," and of Prof. T. W. Chittenden, of Wisconsin, upon "Nostrums," are reprinted in the latter part of this highly creditable volume.

A large portion of the RHODE ISLAND report is made up of statistical tables in regard to births, marriages, divorces, and deaths throughout the State. No epidemic of diphtheria has occurred in any of the towns, but malarial diseases have been decidedly more prevalent, and sundry sections were invaded for the first time in 1884. Several epidemics of measles in a mild form, and scarlatina of a severe type, are noted, also a few outbreaks of whooping cough have occurred. From typhoid fever an unusual immunity is recorded.

Among the occasional papers, we find reprints of various instructive circulars prepared by the industrious Secretary, Dr. Chas. H. Fisher, chiefly in regard to cholera, and calculated to distribute the requisite information for forearming local sanitary authorities against this dreaded scourge of humanity. Statements in regard to the operations of the cattle commission apprise us that inoculation for hog cholera, which prevailed to a considerable extent, has been practised with alleged advantage in reducing the rate of mortality. Glanders has been detected in twenty horses, among more than two hundred animals inspected. Numerous inspections of cows supposed to be affording a dangerous milk in consequence of their being affected with pulmonary consumption, have been made, and caution is earnestly advised against the danger of introducing contagious pleuro-pneumonia from Western cattle, which are now known to be tainted in many instances with this fatal malady. The most important essay is an elaborate report by Samuel M. Gray, C. E., of Providence, on "Sewage Systems and Sewage Disposal," which is profusely illustrated by twenty-three plates, depicting the various forms of apparatus described. Mr. Gray asserts that whilst the separate system of sewerage (such as that introduced by Mr. Waring into Memphis, Tennessee) possesses great merit, and is particularly valuable in the development of small towns, it is not admitted that the combined system deserves all the censure that has been heaped upon it, nor that the separate system is intrinsically the best in all cases, as has been claimed. "Each system

has its defects as well as its merits, and the choice will depend upon local conditions. The two systems may be used in some cases in different parts of the same city with better results than would be obtained from the exclusive use of either."

From the IOWA report we learn that a gratifying improvement in the influential position of the Health Board has occurred during the past few years, so much so that the community accept and adopt to-day any regulation of the board, which five years ago would have been received with indifference if not with contempt. A large part of the volume is taken up with statistical tables, records of proceedings, and abstracts of reports, from local sanitary authorities prepared by the indefatigable secretary and assistant. Among the interesting papers which compose the remainder of the book our limited space only permits us to notice the following timely article upon "Overpressure in Schools," by Dr. W. S. Robertson, President of the State Board of Health, in which the folly of the forcing system, too common in our educational institutions, is eloquently insisted upon. An elaborate essay on the "Lighting and Seating of Schoolhouses" from the pen of L. F. Andrews, Acting Secretary of the Board, is illustrated by numerous engravings, and a reprint of Snellen's test-types for use in testing the acuity of vision. His thirteen rules for teachers, would if obeyed, largely aid in removing the defects now so manifest in a large majority of the public schools. A short paper by H. H. Clark, member of the Health Board, on the "Communication of Contagious Diseases by Second-hand School-books," expresses the opinion that danger from such a source is exceedingly small, as letters of inquiry answered by two hundred and fifty physicians in various parts of the United States, failed to elicit the history of a single event of this kind. Dr. J. M. Hull, in an interesting article upon "The Opium Habit," declares that from reliable information he feels safe in saying that there are in Iowa over ten thousand people constantly under the influence of an opiate, and urgently advocates some means for checking the rapid spread of this evil. Such restrictive measures, he thinks, may be found to some extent in legislative enactments regulating the sale of opium and its preparations, but the great means for accomplishing this desirable object is undoubtedly popular instruction in regard to the danger of prolonged use of opiates, especially by hypodermatic injection. J. G. R.

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A TEXT-BOOK ON MEDICAL PHYSICS, FOR THE USE OF STUDENTS AND PRACTITIONERS OF MEDICINE. By JOHN C. DRAPER, M.D., LL.D., Professor of Chemistry and Physics in the Medical Department of the University of New York, and of Natural History and Physiology in the College of the City of New York, etc. With 377 illustrations. 8vo. pp. 733. Philadelphia: Lea Brothers & Co. London: J. & A. Churchill, 1885.

AMONG the books that medical students of a former generation were advised to read was Arnott's *Elements of Physics, General and Medical*. It is long since out of print, but there are still living many who re-



member with pleasure its clear and untechnical explanations of physical phenomena. For this generation there is no American publication to take its place, unless that position be accorded the new work by Dr. Draper.

The subject-matter of this book is very different from that of Arnott; indeed, some of its most important facts were unknown even at the latest date of the latter publication. Some observations concerning the physiological effect of variations of atmospheric pressure had been recorded, but the epoch-making researches of Paul Bert and his co-workers are of recent date, and real knowledge of that subject begins with the publication of his treatise on *Barometric Pressures*. In his abstract of Bert's work, Dr. Draper presents at some length the method of study and also the conclusion, namely, that all the effects known as *mal des montagnes* experienced at and above an altitude of 10,000 feet, can be produced at the sea level without change of pressure, by reduction of the percentage of oxygen in the air respired.

The fruitful inquiries of Junod and Pravaz, upon the therapeutic influence of compressed air, are adequately set forth. Compressed air was shown by them to have much the same effect as one too rich in oxygen. There is a poison line for oxygen as well as for pressure of the inspired air. As a corollary to these facts, it is suggested that in building bridge piers in caissons, at depths giving more than five atmospheres of pressure, grave consequences may be averted by employing an atmosphere containing a smaller per cent. of oxygen than normal air. The later advances in acoustics and optics have had intimate relations to medicine, and make some acquaintance with these sciences necessary to the properly equipped physician. The specialist will still need his Helmholtz, but the general medical reader will find in Draper as good an epitome of the phenomena of sound and light as he cares for.

The microscope is there dealt with as an instrument of research. Carpenter is borrowed from liberally in this connection. The bacteria do not escape notice; they are pictured, cilia and all.

The latest methods of germ-culture are referred to, though it can scarcely be said that they are described with the minuteness requisite for exact studies in this highly technical field.

There is a good summary of electrotherapy at the close, for which due credit is given to Bartholow, Morgan, and Robertson. The book makes such interesting reading to a doctor, that one is loath to say that part of it has no medical bearing whatever. To be sure, the principles of a science lie at the root of its applications and must be taught if teaching be thorough. Much of every technical work must be devoted to general truths; still, the medical reader would not have missed the delightful chapter on Ultra-Gaseous Matter, had it been omitted along with various paragraphs alluding to non-medical applications, such as the Morse telegraph. If these are retained in the second edition, Arnott's title, "Physics, General and Medical," would better indicate the nature of the contents.

J. W. H.



A MANUAL OF OPERATIVE SURGERY. By LEWIS A. STIMSON, B.A., M.D., Surgeon to the Presbyterian and Bellevue Hospitals, etc. Second edition, with 342 illustrations. 8vo. pp. xxiv. 506. Philadelphia: Lea Brothers & Co. London: H. K. Lewis, 1885.

PRACTICAL SURGERY: INCLUDING SURGICAL DRESSINGS, BANDAGING, FRACTURES, DISLOCATIONS, LIGATURE OF ARTERIES, AMPUTATIONS, AND EXCISIONS OF BONES AND JOINTS. By J. EWING MEARS, M.D., Lecturer on Practical Surgery and Demonstrator of Surgery in the Jefferson Medical College, etc. With 490 illustrations. 8vo. pp. xii. 794. Philadelphia: P. Blakiston, Son & Co. London: Cassel & Co., Limited, 1885.

It is a pleasure to call attention to two such admirable books from the pens of American surgeons as we have here. Both authors are men of experience in the practice and in the teaching of surgery, and both of them have presented such manuals as this fact would lead one to expect. They are full of good common sense and may be safely taken as guides in the matters of which they treat. The very numerous illustrations add much to the value of these books. Those in the book of Dr. Mears include a large number representing surgical appliances and apparatuses, as might be expected from the fact that more than half of it is occupied with the discussion of dressings, bandaging, fractures, and dislocations. Dr. Stimson's book, on the other hand, contains the larger number of illustrations of defects and injuries, and of the operations for their relief.

It would be hard to point out all the excellences of these two books, and it is not easy to find defects in them. But we note with some surprise that Dr. Mears has not given any account of the way in which to perform an operation in regard to which he has eminently the right to speak, viz., partial excision of the upper jaw for ankylosis; and that Dr. Stimson has not described the best *technique* of the operation of suprapubic lithotomy.

In conclusion, we can heartily recommend these books to students, and to practitioners of surgery, who will find in each an amount of attention given to the details of operative methods which cannot be expected, and which certainly cannot be found, in the larger works on general surgery.

C. W. D.

# QUARTERLY SUMMARY

OF THE

## PROGRESS OF MEDICAL SCIENCE.

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### ANATOMY.

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UNDER THE CHARGE OF  
GEORGE D. THANE, M.R.C.S. ENG.,  
PROFESSOR OF ANATOMY AT UNIVERSITY COLLEGE, LONDON.

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#### THE MORPHOLOGY OF THE SKELETON OF THE HAND AND FOOT.

In earlier communications to the Philosophical Society of Jena PROF. K. BARDELEBEN announced his discovery of a hitherto unrecognized bone, which he termed *os trigonum*, in the tarsus of many marsupials. A cartilaginous rudiment of this bone is present in the early human embryo, and usually becomes fused with the astragalus, the posterior process of which it forms, but it occasionally ossifies independently and gives rise to a supernumerary tarsal ossicle. In the *Jenaische Sitzungsberichte* for 1885, he publishes the results of further researches into the constitution of the skeleton of the mammalian manus and pes, of which the following is a brief summary: In the human fœtus from the sixth to the eighth week the cartilaginous navicular of the tarsus is divided into two parts, inner and outer, a condition that recalls the double navicular bone of rodents. The tuberosity of this bone is also ossified from a separate centre appearing at the time of puberty. In the manus of some insectivora Bardeleben has found another ossicle which he names *triangulare carpi*, and in cryptoprocta a corresponding *triangulare tarsi*, the element thus represented being a second centrale. Indications of the triangulare are also present in man, in whom it becomes incorporated in the magnum and external cuneiform respectively. Traces of an original division are to be recognized in the semilunar, pyramidal, unciform, trapezium, astragalus, calcaneus, cuboid, and internal cuneiform. The styloid process of the ulna and the internal malleolus of the tibia are represented in the fœtus by detached portions of cartilage.

The author has also collected a mass of evidence in support of the earlier existence of a sixth digit on the preaxial side of the pollex and hallux. Vestiges of this *prepollex* and *prehallux* occur in the form of accessory ossicles in many animals, and supernumerary digits in this position in man are re-

garded as theromorphic varieties dependent upon atavism. There exist also less pronounced indications of a seventh, postaxial digit.

In consequence of these researches Bardeleben believes that the typical carpus or tarsus must be regarded as consisting of fifteen or seventeen factors, arranged in a proximal and a distal row of six or seven elements each, being one for each original digit, and an intermediate row of three centralia. He is inclined to derive the digitate appendage from a series of parallel rather than diverging rays.

#### THE SACRAL INDEX IN VARIOUS RACES OF MANKIND.

PROF. W. TURNER discusses the form of the sacrum in different races of men, and uses the terms *dolichohieric* to signify a sacrum longer than broad (index below 100), and *platyhieric* for a sacrum in which the breadth exceeds the length (index above 100). From measurements of male specimens made by himself and those recorded by previous observers, he has drawn up the following provisional table:

DOLICHOHIERIC.	PLATYHIERIC.
Australians.	Europeans.
Bushmen.	Negroes.
Hottentots.	Melanesians.
Kaffirs.	Polynesians.
Andamanese.	Hindoos.
Tasmanians.	Guanche?
Chinese?	Esquimaux?
Aino?	North American Indians.
Malays.	South American Indians.

A dolichopellic brim is generally associated with a dolichohieric sacrum, a platypellic brim with a platyhieric sacrum. In the anthropoid apes the sacrum is markedly dolichohieric, the index in the orang being eighty-seven, in the chimpanzee seventy-seven, and in the gorilla, seventy-two.<sup>1</sup>—*Journ. of Anat. and Physiol.*, January, 1886.

#### THE MUSCLES OF THE ORBIT AND THE CAPSULE OF TENON.

C. B. LOCKWOOD describes, in addition to the tendon of Zinn, a similar common tendon of origin for the superior and the upper portions of the internal and external recti, arising from the upper and outer part of the margin of the optic foramen, and placed on the ocular aspect of the muscles. He has also studied, principally by means of frozen sections, the anatomy of the capsule of Tenon, especially in its relation to the ocular muscles. The *external* and *internal check ligaments* are wedge-shaped in horizontal section, and consist mainly of elastic tissue; but they receive also some of the superficial muscular fibres of the corresponding recti. The base of the wedge is turned forward, and is attached by its ends to the suspensory ligament of the eye and the malar bone or lachrymal crest respectively. A distinct fascial sheath surrounds the forepart of the levator palpebræ, and becomes blended on its under surface with the sheath of the superior rectus derived from the

<sup>1</sup> In the report of Prof. Turner's paper on the index of the pelvic brim in the last number of this journal, the terms expressing the classification were, by a printer's error, wrongly given: they should be *platypellic*, *mesatipellic*, and *dolichopellic*.

capsule of Tenon. Into the angle of junction of the two sheaths fibres pass from the rectus, and that muscle is thus connected with the tendon of the levator and the upper eyelid. As the expanded tendon of the levator is attached on each side to the margin of the orbit, this apparatus acts also as a check ligament to the superior rectus. The lower portion of the sheath of the inferior rectus is divided into two layers, an upper, which is continuous with the suspensory ligament of the eye, and a lower, which joins the delicate sheath of the inferior oblique, while both are attached in front to the lower eyelid. The *suspensory ligament of the eye* is a boat-shaped thickening in the capsule of Tenon beneath the lower fourth of the circumference of the eye, and attached by its ends to the lachrymal and malar bones. The ocular muscles perforate the capsule of Tenon by well-defined openings opposite the equator of the eye, and the hinder margins of the apertures for the recti are formed by fibrous bands, called the *intracapsular ligaments*, to which the function is attributed of protecting the eye from pressure during the action of the muscles. The membranous capsule of Tenon is separated from the sclerotic by a layer of loose connective tissue, which is termed the *tunica adventitia*.—*Journal of Anatomy*, October, 1885.

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#### THE VENOUS PLEXUSES AND MUSCLES OF THE FEMALE PERINEUM.

According to the investigations of TSCHAUSOW (*Archiv f. Anatomie*, November, 1885), the veins of the female genito-urinary organs form in the pelvis and perineum the following four plexuses :

1. The *urethro-vesical plexus* lies on the front and sides of the urethra and lower part of the bladder. Into it enter the dorsal vein of the clitoris, the right and left pudic veins (which unite in an arch between the urethra and symphysis pubis), short veins from the corpora cavernosa clitoridis, a communicating branch with the obturator vein, and slender branches from the wall of the urethra and neck of the bladder.

2. The *utero-vaginal plexus* surrounds the vagina and the neck and body of the uterus, forming on each side of those organs a dense convoluted mass, which is traversed by the lower end of the ureter. It receives tributaries from the uterus and vagina, the base of the bladder, the bulbs of the vestibule, and the front of the anus (*venæ hemorrhoidales inferiores anteriores*). The efferent vessels of the urethro-vesical and utero-vaginal plexuses, *vesical*, *vaginal*, and *uterine veins*, pass outward and backward to the internal iliac veins.

3. The *utero-ovarian plexus* is formed by the veins of the fundus of the uterus, the Fallopian tube and the ovary, and empties into the ovarian vein.

4. The *perineal plexus* consists of two parts: the one, superficial, is formed by the veins of the labia majora and some of those from the preputium clitoridis and bulbs, passing to the superficial perineal vein, and has communications with the superficial epigastric and pudic and the external obturator veins; the other, deep, receives the veins of the corpus cavernosum clitoridis, veins from the bulb, and a considerable branch descending from the dorsal vein of the clitoris along the inferior ramus of the pubis, and terminates in the internal pudic trunk, which is joined by the superficial perineal and the



inferior hemorrhoidal veins as it runs backward to open into the internal iliac trunk.

The muscles of the forepart of the perineum form two strata, a superficial, including the bulbo-cavernosus, ischio-cavernosus, and transversus perinei superficialis, and a deep, comprising the transversus perinei profundus, sphincter vagino-urethralis, and sphincter urethræ.

The *bulbo-cavernosus* springs from the perineal septum and anterior extremity of the sphincter ani externus, and terminates in two layers which embrace the body of the clitoris, the right and left halves joining in the mesial plane. The muscle compresses the glands of Bartholin, the clitoris with its dorsal vein, and the veins issuing from the bulbs of the vestibule.

The *transversus perinei profundus* passes from the conjoined pubic and ischial rami to the perineal septum. In well-developed specimens a superficial layer of fibres is directed obliquely forward to the bulb. It is a tensor of the middle perineal fascia (triangular ligament).

The *sphincter vagino-urethralis* lies partly over the outer edge of the vestibule, and partly beneath its bulb, along the side of the vagina at the level of the hymen. The fibres terminate in front on the anterior aspect of the lower part of the urethra; behind, the lower ones reach the perineal septum, the upper ones end on the side of the vagina.

The *sphincter urethræ* (externus) is a layer of circular striped fibres surrounding the upper half of the urethra, and traversed in its posterior part by bundles of longitudinal fibres. Within this muscle is the sphincter urethræ internus, consisting of plain fibres.

The transversus vaginæ of Führer, the constrictor urethræ and transversus urethræ of Lesshaft do not exist.

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#### THE CAVERNOUS SINUS.

PROF. K. VON LANGER gives (*Wiener Sitzungsberichte*, May, 1885) the results of an investigation of the cavernous sinus by means of sections and corrosion-preparations. In the child it is represented by a venous plexus in the dura mater, which, by enlargement and fusion of its channels, becomes the sinus with its characteristic cavernous structure. In old age the trabeculæ diminish and the cavity becomes simpler. The carotid artery, with the sixth nerve, lies against the outer wall of the sinus, and is separated from the body of the sphenoid by the blood-space. The basilar plexus (Virchow) shows similar variations with age, and the occipital sinuses are persistent channels of a plexus covering the lower part of the occipital squama in the fœtus. Langer has also found in children a plexus formed by branches of the ophthalmic veins resting against the orbital surface of the great wing of the sphenoid, and corresponding to a largely developed plexus in the orbit of ruminants.

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#### THE ORIGIN OF THE SPINAL ACCESSORY NERVE.

The origin and central course of the spinal accessory nerve have been studied by L. DARKSCHEWITSCH in transverse and frontal sections of the medulla oblongata and upper part of the spinal cord in fœtuses of various ages. In the spinal cord the roots traverse the direct cerebellar tract, the crossed pyramidal tract, and the lateral portion of the anterior gray cornu, describing

a curve with its concavity turned forward and outward. In the anterior horn the fibres join the outer group of nerve cells which is regarded as the special nucleus of the spinal accessory nerve. A distinct external group of cells is found as far down as the lowest part of the fifth cervical nerve, coinciding with the extent downward of fibres of origin of the spinal accessory nerve. In the medulla oblongata the fibres of the accessory portion of the nerve pursue a similar but more sharply curved course, and join a collection of cells continued upward from the spinal nucleus, and situated on the dorsal side of and external to the hypoglossal nucleus. Its upper limit is about on a level with the union of the middle and lower thirds of the olivary body. The roots of the accessory portion are also joined by fibres from the funiculus cuneatus and its nucleus. From the origin of both spinal and accessory portions from one continuous nucleus, from the similar course of the fibres of origin within the nervous centre, and from the large size of the fibres composing both portions, it is concluded that the generally accepted view is correct, according to which the two are regarded as parts of one nerve.—*Arch. f. Anatomie*, November, 1885.

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#### THE BLOODVESSELS OF THE SALIVARY GLANDS.

PROF. N. KOWALEWSKY, of Kasan (*Archiv f. Anatomie*, November, 1885), finds, by adopting a system of incomplete injection, that in the submaxillary gland of the cat there exist two systems of vessels which differ in the resistance they offer to the blood-stream; one system, of lesser resistance, with capillaries in the walls of the ducts, and another system, of greater resistance, having its capillaries in the lymph spaces between the alveoli. He infers from this that in the resting condition of the gland the blood flows mainly through the capillary network of the ducts, while in the active state the dilatation of the intralobular arteries lessens the resistance in the alveolar vessels, and at the same time the flow of the secretion by distending the ducts diminishes the lumen of the capillaries in their walls and thus throws more blood into the capillaries of the alveoli. It is probable that the epithelium of the small ducts takes part in the secretion of the saliva.

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#### THE DEVELOPMENT OF THE SALIVARY GLANDS.

PROF. CHIEVITZ, of Copenhagen (*Archiv f. Anatomie*, November, 1885), divides the mass usually described as the sublingual gland into the *alveololingual glands*, which open into the mouth by the ducts of Rivini, and the *sublingual gland* proper, from which the duct of Bartholin springs, the latter portion being, however, by no means constantly present in man. All the salivary glands take their origin as buds of the epithelial lining of the mouth cavity. The submaxillary gland is the first to appear, being present in the human embryo of the sixth week as a process of the epithelium at the bottom of the alveololingual sulcus. The epithelium becomes considerably thickened at the spot where the submaxillary process springs from the sulcus, and the sublingual gland begins as an offset from the outer side of this thickening. Absence of the sublingual gland is due to a want of development, and not to subsequent atrophy of the process. At the eighth week the bud of the parotid gland is seen growing from the lateral angle in which the roof

and floor of the mouth meet, and situated in the same frontal plane as the submaxillary rudiment. By the tenth week the alveololingual glands have appeared as buds in the alveololingual sulcus external to the position of the submaxillary gland. The submaxillary process is placed at first altogether behind the lingual nerve, and as it lengthens its oral extremity advances, so that the duct is thus made to cross the loop of the nerve. The parotid rudiment grows backward over the masseter muscle, and only when its extremity has reached the retromaxillary space does it begin to give off secondary buds, with the exception of an ascending branch to form the socia parotidis.

A lumen is soon formed in the main ducts, but in the parotid the last branches are still solid at the beginning of the fifth month. In the serous glands the epithelial cells of the smaller ducts and alveoli do not fully develop their special characters until after birth. In the alveololingual glands mucin-cells are present, and some of the alveoli are excavated by the sixteenth week. The epithelium of the mucous alveoli is single-layered, and the lunulæ of Gianuzzi are the result of sections not passing through the lumen. The growth of the glands after birth is entirely due to enlargement of the ducts, and especially of the alveoli, and not to the formation of new buds.

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#### THE ARTICULATIONS OF THE COSTAL CARILLAGES AND THE POSITION OF THE HEART.

PROF. KARL BARDELEBEN (*Jenaische Sitzungsberichte*, July 31, 1885) finds that an articulation between the fifth and sixth costal cartilages is present on the right side in sixty per cent. of subjects, on the left side in forty per cent. The articulation between the sixth and seventh cartilages is very rarely absent. An eighth sternal rib occurs in more than ten per cent. He considers that the human thorax is undergoing retrogressive development, leading to a reduction in its length, and that the same is the case with the dorso-lumbar portion of the vertebral column.

The position of the heart is subject to more frequent and greater variations than Henke admits. The pulmonary valves may lie behind the second intercostal space, the third cartilage, or the third space; the apex of the heart opposite the fifth rib or fifth interspace.

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#### ON THE LEVEL OF THE DIAPHRAGM, THE EXTENT OF THE PLEURA, AND THE POSITION OF THE ARTERIAL ORIFICES OF THE HEART.

C. SICK (*Archiv f. Anatomie*, November, 1885) has made observations on a number of subjects, both adults and children, by thrusting needles through the thoracic wall, as to the variations in the level of the right vault of the diaphragm, the course of the margin of the left pleura behind the sternum, and the position of the aortic and pulmonary orifices in relation to the chest-wall.

He found that the height of the right vault of the diaphragm varies from the level of the fourth to the seventh chondro-sternal articulation, but is most frequently (in 17 out of 34 cases) opposite the sternal extremity of the fifth cartilage; it tends to be lower in old persons.

The course of the anterior margin of the left pleura is recorded in 23 adult subjects. In 17 of these it was still behind the sternum at the level of the articulation of the fifth cartilage; in 10 the line had not yet crossed the edge of the sternum at the sixth cartilage, and in 4 it was less than 1 cm. distant. At the seventh cartilage, in 9 cases the pleura still reached the sternum, or was reflected on to the diaphragm at a higher level; in 2 it was less than 1 cm. from the edge of the sternum. In 12 children, the line of reflection of the left pleura was, opposite the fifth cartilage, always behind the sternum; at the level of the sixth cartilage still behind the sternum 8 times, and 3 times not more than 3 mm. distant, while at the seventh cartilage in 8 cases the pleura either reached the sternum or had already passed back on to the diaphragm. The greatest distance of the pleura from the edge of the sternum at the level of the fifth, sixth, and seventh cartilages, in the adult, was 3, 4, and 5 cm. respectively. The author recommends that, in order to be sure of avoiding the pleura, puncture of the pericardium should be practised at the left edge of the ensiform process through the so-called cleft of Larrey in the diaphragm, or by trephining the lower end of the sternum, or by resecting a portion of the sternal end of the sixth or seventh costal cartilage.

The aortic and pulmonary valves, in 27 cases, were placed opposite the second intercostal space once (in a child of two years), the third costal cartilage 12 times, the third interspace 5 times, the fourth cartilage 5 times, the fourth interspace once, and the upper edge of the fifth cartilage 3 times (all old persons). Braune's statement that the position of the arterial orifices becomes lower with advancing age is thus confirmed.

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#### THE INJECTION OF ANATOMICAL PREPARATIONS.

A. K. BJELOUSSOW recommends (*Archiv f. Anatomie*, November, 1885) for this purpose a mixture of borax and gum-arabic. The mass is injected cold, and is then fixed by immersion in spirits. By treating the preparation with glycerine the injection is rendered transparent; and it can be removed at any time by acting upon it with dilute acetic acid.

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#### THE ORIGIN OF THE LIGAMENTS OF THE OVARY AND FALLOPIAN TUBE.

In the female embryo, so long as the ovary occupies its original position in the lumbar region, a fold of peritoneum, which was figured by Vrolik in the human foetus, and described by Kölliker in the cow, descends from the diaphragm to the closely adherent upper ends of the ovary, Fallopian tube, and Wolffian body. Within this fold C. WIEGER (*Archiv f. Anatomie*, November, 1885) has traced a band of plain muscular tissue passing from the diaphragm to the Wolffian body, and constituting a *phrenico-Wolffian ligament*. With the descent of the ovary, the ligament is lengthened, and its upper part gradually disappears. The lower part, on the other hand, widens and, its marginal fibres becoming attached to the ovary and the extremity of the Fallopian tube, acquires the form of an inverted Y, the inner branch of which passes to the ovary and the outer to the tube, while the atrophied Wolffian body, or parovarium, occupies the intermediate angle. Through the further shrinking of the parovarium, the  $\Lambda$  becomes a  $\mathbb{J}$ , and the peritoneal covering of the ligament is raised into corresponding folds. The lower transverse fold



constitutes the ligamentum infundibulo-ovaricum, and the vertical fold is the ligamentum infundibulo-pelvicum. Wieger also describes the development of the ligament of the ovary, as well as the round ligament of the uterus, from the gubernacular band, which descends from the Wolffian body to the inguinal region.

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## PHYSIOLOGY.

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UNDER THE CHARGE OF

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### CALORIMETRY.

M. CHARLES RICHTER, after an exhaustive historical sketch of the subject, describes a new apparatus for estimating the amount of heat produced by a warm-blooded animal in a given time under varying circumstances.

It consists of a double-walled chamber, the intermural air space being in connection with a water chamber, to which is attached a measuring apparatus composed of a siphon—adjustable to avoid pressure differences—and a graduated tube for receiving the overflow of the liquid displaced by the expansion of the air between the walls of the chamber in which the animal is placed. The bulk of water displaced is first carefully estimated by substituting a known amount of water of a given temperature instead of the animal, so that the amount of water in the place of the animal, multiplied by the fall of temperature observed, gives the number of *calories* imparted to the instrument. By noting the amount of water caused to overflow by a given number of calories, a table of arbitrary constants may be drawn up, so that it is only necessary to read off the amount of the overflow to find the corresponding amount of heat given off. If necessary, a graphic method may be employed. He experimented with infants, dogs, rabbits, guinea-pigs, and birds.

He found that the size of the animal had an important influence on the quantity of heat produced, viz., with the increase of volume there was observed a direct diminution of the amount of heat produced per kilogramme of the weight of the animal. This, he thinks, depends on the change in relation of surface to the cubic displacement—measured by weight—so that if the animals be reduced to their proximate spheres, the amount of heat given off per unit of surface area is found to be remarkably similar in all classes of animals. The heat production also varied with the external temperature, and reached a maximum at medium temperature (about 13° C. for rabbits). The diminution at the higher grades of external temperature, he thinks, depends on the physical law, that with diminished temperature-difference between two media a diminution in the rate of radiation occurs, so the nearer the external temperature approaches that of the animal, the less loss of heat is recorded. The decrease of heat-output found at lower temperatures he considers to depend upon purely physiological grounds, viz., on the fact that the nervous

system takes some time to become accustomed to the increased production of heat necessary to keep up an even temperature after a fall occurs, and the vasomotor mechanisms check the rapidity of the radiation. Further, the kind of covering of the animal causes a difference in the amount of heat registered, being greatest with naked animals (infants), and least with birds. He concludes: The amount of heat produced by a normal animal depends on three principal factors, viz.: (1) The surface of the animal (*i. e.*, the less the volume of the animal the greater relative surface is exposed). (2) The external temperature. (3) The condition of the tegumental coverings, since radiation is less in proportion as the coats are thick.

In a subsequent paper he gives the result of experiments on rabbits under varying conditions, and finds: (1) Animals deprived of hair give off fifty per cent. more heat and rapidly lose body weight. (2) Rabbits whose coat is partly oiled give out considerably more heat; in one example the animal lost nineteen per cent. of its weight in twenty-four hours. (3) When the surface of the animals is moistened with water they give out more heat; not only while wet, but also after they have been carefully dried; this, he thinks, indicates that the nervous system has "ordered" an excess of production of heat which persists for some time after the cause of its requirement has been removed. (4) White rabbits radiate less than dark ones, a fact which may be explained on physical grounds. (5) Animals stimulated electrically radiate more heat as well as increasing the absolute body temperature during the stimulation. (6) The elevation of the body temperature produced by cocaine, mentioned by Laborde, depends on an increased production of heat, for the quantity of heat radiated is also increased by this drug. Cocaine, then, must accelerate the chemical change of the tissues, and "gives fever" by stimulating the nerve centres. (7) He confirms the statement that the nerve centres influence the body temperature, and calculates that the production of heat may be increased fifty per cent. by direct irritation of certain parts of the cerebral cortex.—*Archives de Physiologie, Normale et Pathologique*, 30 Sept., 15 Nov., 1885.

#### PHOTOGRAPHIC RECORD OF THE PUPILLARY MOVEMENTS.

DR. BELLARMINOFF, working in the laboratory of Prof. Tarchanoff in St. Petersburg, employs instantaneous photography for making a record of the movements of the iris. Hitherto much difficulty has been found in making accurate measurements of the rates of movement, etc., of this muscle, as the period occupied by the changes in the pupil could only be estimated by direct observation of the eye without any exact standpoint by which to gauge the time. He employs an ordinary photographic apparatus, to which a dark-chamber with a revolving drum is added. The image is thrown on a sheet of very sensitive paper, which is made to move evenly across the axis of the instrument in the position of the screen; the rate of movement of the paper is shown by a time-marker. Only those rays which pass through a narrow slit placed in front of the observed eye reach the dark-chamber, and affect the sensitive paper, so that the changes in one diameter only are recorded. The head is firmly fixed, and the eye placed in such a position that the slit corresponds to the centre of the pupil. The eye is then well illuminated.

In blond men, white rabbits, cats, and some other animals with blond irides, the distinction between the iris and other parts is sharply marked, so that the pupil causes a white band to appear on the paper. Variations in the diameter of this band allow the extent, duration, etc., of movements of the iris to be accurately determined by comparison with the record of the time and of the period of stimulation which are simultaneously recorded on the paper.

The application of the method is still engaging his attention, and he refrains from giving many results.—*Arch. f. d. Gesam. Physiologie*, 13 Oct. 1885.

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#### PHOTOHÆMOTACHOMETER.

DR. NAPOLEON CYBULSKI, by an ingenious method, makes a continuous photographic record of the changes in the velocity of the blood current. Since the velocity of the stream bears a constant relation to the pressure-difference at any two given fixed points, he measures the pressure of two neighboring parts of an artery with a differential manometer of special construction, the limbs of which are so close together that a ray of light passing through a narrow slit may pierce each tube and throw the shadow of the contained fluid on the moving sensitive photographic paper. The height of each column of liquid can be thus recorded and the difference in pressure which corresponds to certain velocities having been determined by calculation, the difference of level at which the two columns of fluid stand in each tube may be taken as indicating the velocity and read off from the photographic record. By this means the rapid changes in velocity dependent on the different phases of the heart's cycle can be readily seen. In the carotid of a dog the rate during systole was found to be 248 mm., while that during diastole was only 127 mm. Several photograms are given which show the relation of the changes in blood-pressure and rate of breathing to the velocity of the blood before and after experiments on the vagi.—*Archiv f. d. Gesam. Physiol.*, 5 Nov. 1885.

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#### CHEMICAL CHANGES IN MUSCLE.

MAX VON FREY and MAX GRUBER, working in the Leipzig Physiological Institute under the guidance of Ludwig, constructed a new apparatus for investigating the above question.

It consists of a set of perfectly air-tight tubes through which defibrinated blood may be repeatedly conducted to the bloodvessels of the organ, or part to be investigated. In connection with various parts of the tube are: 1. An artificial lung, consisting of a chamber so devised that the extensive surface of a thin layer of blood is exposed to air in which the amount of oxygen is kept constant, fresh oxygen being supplied to replace that used up by the blood during its passage through the artificial lungs. The CO<sub>2</sub> is removed from the chamber by pumping the air through baryta water, as in Regnault and Reiset's method. 2. Special apparatus for estimating the amount of oxygen used and the amount of CO<sub>2</sub> formed, and also arrangements by which the exact percentage of these gases in the artificial lung can be determined. 3. A mechanical motor by which the blood can be pumped onward in one direction, and the velocity of flow nicely regulated. 4. Warming and cooling apparatus, by which the temperature of the blood in either the lung or the



tissue can be raised or lowered at will. 5. Arrangements for taking samples of blood from various portions of the tube, in order to control the gas analyses made by the other methods.

The experiments, which are communicated in a separate paper by Max von Frey, were carried out on the posterior part of dogs. After the death of the animal, the viscera were removed and their bloodvessels secured. The aorta and vena cava were then connected with the tubes containing the blood, and hemorrhage from the cut surfaces was prevented by a special clamp. The artificial circulation was continued for several hours (in one case seven); so that the results did not depend on a single sample of blood, but upon the continued determination of the requirements of the tissues during a considerable time. The amounts thus obtained were so great that the possible errors were reduced to a minimum.

With regard to the amount of oxygen used up by the preparation the following facts were determined: It was much below that calculated for the normal animal by Regnault and Reiset. Temperature had a marked effect on the absolute amount of oxygen used, and also upon the change of amount toward the end of the experiment. The average amount used per kilo of preparation in every half hour was 22 cm. at the room temperature ( $18^{\circ}$ – $20^{\circ}$  C.), while the average amount used when at about the body heat ( $36^{\circ}$ – $37^{\circ}$  C.) was 51.5 cm. per kilo in half an hour—*i. e.*, 100:234. In the "warm experiments" the amount fell toward the end of the experiment, but at room temperature the same standard of absorption of oxygen continued throughout.

Considerably more oxygen was consumed by the muscles while contracting, the average proportion of O used by the muscles at rest and during contraction, for the cold experiments, being 100:196.5, and for the warm 100:135.2 respectively. The increment was always much greater when the temperature of the preparation was not raised above that of the room.

With regard to the absorption of carbonic acid by the baryta-water valves, it was found that as the pressure of  $\text{CO}_2$  in the lung chamber was kept nearly at zero, much of the  $\text{CO}_2$  which really belonged to the blood came off from it. This occurred at the early part of the experiment; and as the blood became poor in  $\text{CO}_2$ , the amount taken up by the baryta became less and less. In order to determine the amount formed in the tissues, it therefore became necessary to estimate the volume per cent. of  $\text{CO}_2$  in the blood before and after the experiment, and subtract the difference from the total amount found in the baryta.

In two "cold experiments" the average amount of  $\text{CO}_2$  given off by the preparation was 32.6 and 33.5 cm. per kilo in half an hour while at rest. When the muscles were stimulated the amount rose to 50 and 43 cm.—*i. e.*, 100:156.2 and 100:133 respectively. In three experiments at the body temperature the average amount of  $\text{CO}_2$  given off during rest was 52.5, 61, and 57 c. cm. In the same experiments, when the muscles were contracting, 62, 86, and 66 c. cm. were given off, thus showing an increment in the proportion of 100:118, 100:141, and 100:115.5 respectively. As in the case of the oxygen, the contractions caused a smaller increment of  $\text{CO}_2$  in the heated than in the muscle at the ordinary room temperature, but the difference in the amount of  $\text{CO}_2$  was less than that of the O with the same fall in temperature.

On account of the increment of  $\text{CO}_2$  being less than that of the O during



contraction, and the remarkable way in which the blood parted with its normal  $\text{CO}_2$ , it was considered that during the period of contraction the O must be used in the production of some other substance, probably lactic acid.

The quantity of lactic acid given out was found to be surprisingly great. In order to determine the amount, one sample of blood was taken before the commencement of the experiment and another after its termination. The analysis showed an increase from 0.1616 gramme to 1.480 gramme of the zinc lactate in the 1200 c. cm. of blood, during three hours' passage through a preparation weighing 3980 grammes.—*Archiv f. Anatomie und Physiologie; Physiol. Abtl.*, Nov. 5, 1885.

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#### THE ACTIVITY OF THE EPITHELIUM OF THE GLOMERULI.

J. G. ADAMI, of Cambridge, working with Haidenhain in the Physiological Institute of Breslau, repeated Nussbaum's experiments on the renal secretion of the frog. He concludes that Nussbaum's method of ligaturing the renal artery is not applicable as a sure means of determining the path by which a substance passes out through the kidney, and founds his opinion on the following facts: Finely divided coloring matters appear in the glomeruli if introduced into the blood after the ligature of the renal arteries. If laky blood be injected into the vessels of a frog after ligature of the renal arteries, the hæmoglobin is eliminated by the glomerulus, and appears in the shape of menisci in the capsules. Further, the urinary flow frequently begins again some little time after ligature of the renal arteries. As the excretion of the hæmoglobin by the glomeruli occurs when there is no apparent passage of water, it would seem that the glomerular epithelium has properties of a definite secretory nature. Again, in the dog, when by section of the spinal cord in the cervical region the blood-pressure is lowered below 40 mm. of mercury, and the urinary flow brought to a standstill, injection of laky blood was succeeded by the appearance of hæmoglobin in the capsule chambers of the glomeruli, although there was no visible contemporaneous excretion of water. Hence, here, too, the glomerular epithelium must be looked upon as possessing powers of a selective secretory nature. Further, a comparison of the amount of hæmoglobin in equal quantities of urine and blood serum in dogs in which hæmoglobinuria had been induced, showed that there could be more than three times as much hæmoglobin in the former as in the latter, while the lymph contained but from a half to a fourth of that present in the serum.

Certain points seem to indicate that sodium nitrate has a direct action of a diuretic nature on the glomerular epithelium, causing a great increase of the watery outflow, and it is assumed that other diuretics, including urea, act in the same way.—*Journal of Physiology*, November, 1885.

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#### THE SUGAR-FORMING FUNCTION OF THE LIVER.

In response to Hofmeister's recent adverse criticism (*Archiv f. exp. Path. und Pharm.*, xix.) of the view that sugar was formed in the liver out of peptone, PROF. SEEGEN, of Vienna, gives the details of some experiments in which he found that the quantity of nitrogen yielded from 100 c.c. of fresh arterial blood mixed with fresh liver tissue, and treated with a current of air for some hours, was greater when a small quantity of peptone had been added.

The quantities of nitrogen in six experiments were :

WITHOUT PEPTONE.	WITH PEPTONE.
0.113	0.300
0.050	0 105
0.043	0.092
0.114	0.252
0.140	0.216
0.070	0 159

The peptone and other proteids having been completely removed before the nitrogen was estimated, it must have come from the products of decomposition of nitrogenous materials, and it appeared doubtless to him that in the presence of arterialized blood the liver cells split peptone into sugar and some crystalline nitrogenous product, and he believes that at least in the case of carnivorous animals, one of the chief duties of the peptone is to form sugar.

In a second paper Prof. Seegen gives three experiments on dogs by which he attempted to settle finally the vexed question whether a diet of cane sugar causes sugar to appear in the urine. He found both cane and inverted sugar in the urine in all three experiments.

In a third paper he brings forward elaborate arguments to prove that the production of sugar in the liver is not—in contradistinction to the production of glycogen—interrupted by inanition or increased by abundant carbohydrate ingesta, but is an independent and unintermittent function of the tissue changes.—*Archiv f. d. Gesam. Physiologie*, Bd. xxxvii., November 5, 1885.

#### DEVELOPMENT OF THE SYMPATHETIC NERVE.

DR. A. ONODI, working out the development of the sympathetic system in fishes, confirmed, in all essential points, the principles laid down by Balfour, namely, that the ganglia of the sympathetic are formed from the same mass of primitive tissue from which the primary nervous centres are developed.—*Archiv f. Microscop. Anat.*, November, 1885.

#### PAPAIN.

DR. SIDNEY H. C. MARTIN, in investigating the properties of the proteolytic ferment "papain" obtained from the juice of the unripe fruit, stem, and leaves of *Carica papaya*, found that it is most active in weak alkaline solutions, but it acts well in neutral media. It acts less energetically than trypsin, but the products formed are the same. The papain is closely associated with a special form of albumose which he calls  $\alpha$ -*phytalbumose* in contradistinction to a  $\beta$ -*phytalbumose*, both of which are present in the papaw juice, and are the proteids upon which the ferment normally has to act.—*Journal of Physiology*, November, 1885.

#### RELATIONSHIP OF UREA FORMATION TO BILE SECRETION.

DR. D. NOEL-PATON finds that the drugs that Rutherford described as stimulants to the bile secretion, also had the effect of increasing the elimination of urea, and (without examining the bile secretion of the animals experimented upon) concludes that the formation of urea in the liver bears a very direct relationship to the secretion of bile by that organ.—*Journal of Anatomy and Physiology*, January, 1886.

## MATERIA MEDICA, THERAPEUTICS, AND PHARMACOLOGY.

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UNDER THE CHARGE OF

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### GYMNOCLADUS CANADENSIS: THE KENTUCKY COFFEE BEAN.

This has been the subject of a research by DR. BARTHOLOW in the Laboratory of Experimental Therapeutics of the Jefferson Medical College. A preliminary report is now made.

It has been known that the coffee bean possessed a certain toxic activity. Flies have been observed to be stupefied by it. As it belongs to the same natural order as physostigma—Calabar bean—it would be supposed, *a priori*, to have analogous powers. Experiment confirms this view. The experiments were made with a concentrated aqueous extract, furnished by Prof. J. M. Lloyd, of Cincinnati.

Gymnocladus was found to affect sensibility, and afterward motility. The area of distribution of the fifth nerve appears to be the last part of the sensory nervous system to retain its irritability. In ten minutes after injecting, subcutaneously, ten minims of the extract in frogs, there was complete sensory paralysis, so that no strength of irritation caused muscular movements. Spontaneous movements ensued, however, and when the skin of the face, or of the eyes, was touched, the lids closed. Vision was chiefly concerned in this response. When the effects attained the maximum, there was universal anæsthesia, and the cerebrum began to be stupefied. With the first impression, vision was rather keen, and the attention lively, but as the effects deepened a soporose state came on. Then the cornea became anæsthetized, so that on irritating it no movements of the eyelids took place, unless the attention was roused enough to direct the vision to the approach of objects.

As regards the motor nervous system, the first effect is a spastic condition of the voluntary muscles generally—the whole body passing into a state of continuous rigidity, followed by paresis beginning in the hind extremities. The motor nerves do not lose their irritability, nor do the muscles fail to contract on indirect and direct stimulation. When the full effects of gymnocladus are produced, and the sciatic nerve stimulated by the faradic current, the calf muscles are thrown into active contractions, and the muscles directly irritated respond energetically. The effects are therefore central and not peripheral. The spastic condition of the voluntary muscles does not entirely cease, and the paralysis throughout wears an aspect of rigidity.

Gymnocladus slows the heart by stimulating the vagus, thus increasing inhibition; afterward with the toxic action reduces its force by an impression, probably, on the cardiac motor ganglia. The number of pulsations of the heart in frogs is reduced one-half. Some lowering of the arterial tension was also noted after the considerable rise first caused by the action of the agent.

From the above experimental data, it is obvious that gymnocladus promises rich returns to the clinical experience of the future.

## POLYGANUM HYDROPIPEROIDES.

This member of our indigenous materia medica has, oddly enough, excited but little attention notwithstanding its remarkable powers. The first effort to attract professional notice to it, as a remedy, was made by a student of the Medical College of Ohio, in 1832, who submitted a thesis for the Doctorate on *Polyganum Hydro Piperoides* as an emmenagogue. This thesis has been read by the writer. At that time, the late Dr. John Eberle was Professor of Practice in that college, and it is believed read the essay, and incorporated so much of it as suited his purpose in the succeeding editions of his treatise on therapeutics.<sup>1</sup> He says, in regard to its use in amenorrhœa, that "with no other remedy or mode of treatment has he been so successful as with this." The late Prof. M. B. Wright, M.D., of Cincinnati, the well-known obstetrician, had an equally high opinion of its value, as he personally informed the writer, and constantly prescribed a saturated tincture for this purpose. At my suggestion, an experimental investigation of its physiological actions was undertaken by MR. J. ELMER PORTER, of the graduating class of 1885-86, in the Laboratory of Experimental Therapeutics of the Jefferson Medical College. I subjoin a condensed summary of his conclusions:

*General effects*, studied chiefly on cats. Preparation: the fluid extract; dose ʒij to ʒv, administered by injection into the peritoneal cavity. The smaller of the two doses was recovered from in twenty-four hours; the larger proved to be lethal in cats weighing three and a half pounds.

It caused incoördination of muscular movements, paresis of the hind extremities, and ultimately general paralysis, contracted pupils, stupor gradually passing into coma, increase in the respiratory movements, and slowing of the heart. After some hours—about eight, when the lethal dose is given—an attempt at recovery ensues, consciousness partly returns, but death occurs in about twelve hours (heart failure?). In cats, after death, the right cardiac cavities are distended, the left contracted and empty.

*Effects on particular organs.* The motor paralysis is spinal in seat. The motor nerves preserve their irritability, the muscles their contractility.

Sensibility is not impaired, the nerves of sensation retaining their power.

The reflexes are first depressed, and finally abolished, as the action on the spinal cord deepens.

The respiratory movements are first increased in number by stimulation of the respiratory centre in the medulla, but death ensues by paralysis of the respiratory muscles, the heart continuing in action somewhat longer.

The slowing of the heart is not due to stimulation of the vagus or of the inhibitory ganglia, but to an action on the cardiac motor ganglia, which are ultimately paralyzed.

The blood-pressure is somewhat lowered, as the tracings made clearly exhibit, and this effect is due to the depression of the cardiac motor ganglia and of the vasomotor centre in the medulla. Temperature is not sensibly affected.

A decided increase of the secretion of various glands—salivary, nasal, gastrointestinal, cutaneous, and renal—occurs, and is due to stimulation of the excito-secretory nerves.

<sup>1</sup> A Treatise of the Materia Medica and Therapeutics, fourth edition, vol. i. p. 441.



The abortifacient effects are quite decided. Impregnated animals—cats and rabbits—abort promptly under its influence. This effect, experimentally demonstrated in animals, is comparable to the clinical observations, proving the power of hydropiper in amenorrhœa.

If the effects of hydropiper are compared to those of pilocarpine, a close analogy may be discerned; the differences are rather of degree than kind.

### HYPNONE.

Hypnone—the new hypnotic, since its introduction a few months ago, has attracted considerable attention. We place before our readers abstracts of some of the more important contributions.

MM. DUJARDIN-BEAUMETZ and G. BARDET present an analysis of its chemical and physiological actions, and suggestions for its therapeutical employment, in *Bull. Gén. de Thérapeutique*, of January 15, 1886.

Discovered in 1857 by Friedel, acetophenone (hypnone) is a type of a large class of mixed acetones derived from two organic acids—one from the fatty, the other from the aromatic series, whence the name *aromatic acetones*, which has been given to this group of bodies. According to Friedel, the proper title of this substance is *phenylmethylcarbonyle*, but Dujardin-Beaumetz has given it the name *hypnone* as a designation which expresses its physiological properties.

Hypnone is obtained by distillation of a mixture of benzoate and acetate of calcium. At the ordinary temperature it is liquid, but if cooled 4° to 5° it becomes a crystalline mass. As a liquid, it is colorless, very mobile, and boils at 198° C. Its density is nearly that of water. One cubic centimetre contains 39 or 40 drops. Each drop weighs about 2½ centigrammes (nearly ½ grain). It is neutral in reaction, but is rather irritating—even caustic—and when applied to the mucous membrane it causes somewhat severe burning pain. It is not soluble in water or in glycerine, but dissolves freely in alcohol, ether, chloroform, benzine, and turpentine. As it has a rather persistent and not agreeable odor, it is difficult to administer. M. Vigier proposes the following as the best formulæ:

Hypnone . . . . .	1 drop.
Alcohol of 90 degrees . . . . .	15 minims.
Syrup of orangeflowers . . . . .	1½ drachms.
Hypnone . . . . .	1 drop.
Alcohol of 60 degrees,	
Syrup of peppermint . . . . .	of each 45 minims.

Dr. Dujardin-Beaumetz thinks the true mode of administering hypnone is in capsule, dissolved in oil or in ether. The capsules may contain 5 to 10 centigrammes (2½ to 5 drops).

Dr. Dujardin-Beaumetz includes in his account of the physiological actions of hypnone, the observations of Grasset, Laborde, Mairat and Combemale, and Dubois and Bidot. After passing in review the phenomena observed in the different classes of animals, he submits the following conclusions:

Hypnone appears to have a triple action: it affects the nervous elements, lessening their functional power; it lowers the blood-pressure; and, in

toxic quantity, modifies the composition of the blood. It is to be included in that group of medicinal agents having hypnotic power by diminishing the cerebral circulation and lessening the excitability of the nerve elements. It is eliminated by the lungs and by the kidneys. According to Popof and Nencki, it is decomposed in its passage through the organism into carbonic and benzoic acids, and is found in the urine ultimately as a hippurate.

Although a poison in sufficient doses, no other effect has been observed in man than sleep. Even when the administration of this agent has been continued for a month, Dujardin-Beaumetz has not observed the denutrition effects noted by Mairct and Combemale in animals, but he never exceeded the dose of 50 centigrammes (about 8 grains). The following are the results of the administration in a healthy man of 20 centigrammes (3 grains), dissolved in ether and given in capsules: At the moment of the rupture of the capsule in the stomach, a sensation of heat is experienced, and in a period which varies from twenty minutes to an hour, the eyes are closed and sleep follows. The sleep is calm; it may be even profound, and the awakening is easy, without nausea and loss of appetite. Sometimes there is a sense of hebetude, or headache. He has observed no other modification of the functions; the respiration and circulation continue normal, and the blood, on spectroscopic examination, exhibits no changes. A notable increase of appetite has been observed in some instances.

The therapeutical applications of hypnone will be confined almost exclusively to the treatment of insomnia. It is neither analgesic nor anæsthetic, and hence in the treatment of insomnia accompanied by pain it is far inferior to chloral. In the wakefulness of phthisical subjects, caused by cough, it proved to have but little effect. Also, in the insomnia of fever, it was found to be less efficient than chloral, even than paraldehyde. The special field of its utility is the nervous insomnia caused by cerebral excitation, which results from mental work or alcoholic excess.

In assigning it to the place which he thinks it will permanently occupy, Dr. Dujardin-Beaumetz places hypnone in the class with chloral and paraldehyde, but in a rank much inferior to the former, and scarcely equal to the latter.

After a consideration of the relative merits of the capsules and the perle as a means of administering hypnone, MAYET concludes that the former is preferable. He holds, further, that sweet almond oil is a better vehicle than ether, as the eructations following when the latter is used, are very offensive to the patient.—*Les Nouveaux Remèdes*, Dec. 15, 1885.

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#### THERAPEUTICAL EFFECTS OF ADONIDIN—A GLUCOSIDE, THE ACTIVE PRINCIPLE OF ADONIS VERNALIS.

DR. ARMAUD DURAND, in *Bull. Gén. de Thérapeutique*, Jan. 30, 1886, writes on this subject: *Adonidin* is an amorphous, bitter substance, colorless and inodorous, soluble in ether and in water, but more soluble in alcohol. It contains no nitrogen.

The action of adonidin is exerted chiefly on the heart, but it has, also, decided diuretic effects. It diminishes the number of heart beats—in one instance to 46—and it increases their strength. It raises the vascular tension,

and this effect is produced very rapidly. The feeble and irregular action becomes strong and regular under its influence. Adonidin, however, is without beneficial effect in those nervous troubles of the heart, such as exophthalmic goitre, and similar conditions.

The diuretic action was very marked in various cases in which it was administered, the amount of urine discharged, in some instances, being doubled in quantity.

In very large doses adonidin caused vomiting and diarrhoea, and an acrid, bitter taste persisted for several hours after the vomiting, but these appear to be toxic phenomena, and are not produced by ordinary medicinal doses. It appears to have no cumulative effects. The medium dose is 2 centigrammes ( $\frac{1}{3}$  to  $\frac{1}{2}$  grain).

The indications for the use of adonidin appear to be the same as those for the use of digitalis. The actions above attributed to it are the same as those ascertained by Bubnow and others in Russia, and by Altmann, Leyden, and others in Germany. It appears to have some advantages over digitalis, in that it is less apt to disorder the stomach, and is less dangerous.

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#### SOME NEW PURGATIVES.

Under this caption, DR. DESNOS, in a note to the Academy of Medicine (*Bull. Gén. de Thérap.*, Jan. 30, 1886), narrates his experience with that group of cholagogues which were the subject of physiological investigation by Prof. Rutherford, of Edinburgh. Dr. Desnos's study included the following resinoids: Baptisin, sanguinarin, juglandin, and phytolaccin. His conclusions are based on observations made on forty-eight patients suffering from various ailments. With sanguinarin he had only negative results, although given in doses considerably larger than those recommended (60 centigrammes, equivalent to 9 grains). On the other hand, he found baptisin and juglandin to be tolerably certain purgatives and efficient cholagogues, in doses of 20 to 30 centigrammes (3 to 5 grains, in round numbers). Phytolaccin (resinoid of *phytolacca decandra*—poke) proved to be the most efficient member of the group. In doses of 10 to 20 centigrammes ( $1\frac{1}{2}$  to 3 grains), it causes easy and abundant bilious stools. Dr. Desnos summarizes his experiences as follows:

"I conclude, then, that baptisin and juglandin are laxatives which may, perhaps, render considerable service, with the exception of some inconveniences [uncertainty of action, tormina, and tenesmus], and that phytolaccin, which is more certain, and in part exempt from the inconveniences just mentioned, is an important contribution to the therapeutics of constipation."

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#### ON THE EMPLOYMENT OF THE SALICYLATE OF LITHIUM IN THE TREATMENT OF RHEUMATISM.

In the treatment of acute rheumatism, as also in acute gout, the salicylate of lithium is quite as effective as the salicylate of sodium. In certain cases of acute articular rheumatism treated with the sodium salt, there comes a period, after rapid and considerable improvement, when the joints still remain somewhat painful, stiff, and swollen, notwithstanding the fact that the remedy is given in doses sufficient to cause toxic phenomena. Under these circum-

stances the salicylate of lithium will cause the last traces of the affection to disappear promptly. It is also more effective in the treatment of progressive subacute articular rheumatism. In patients attacked with this most tenacious and troublesome form of rheumatism, VULPIAN has employed, with the utmost perseverance, the most various medication, including large and repeated doses of the salicylate of sodium, without producing other than the most temporary and insignificant amelioration; and yet he has seen the salicylate of lithium bring about notable improvement in ten to fifteen days. Four grammes (about sixty grains) a day is the quantity of salicylate of lithium usually required. The effects of the remedy begin to be manifest in a half to one hour, and consist in headache—which, however, disappears within a few hours—and vertigo and dulness of hearing, which are more persistent. In some subjects it also causes colic and diarrhœa.

The curative effect of salicylate of lithium is due in large part to the salicylic acid; for, if the other salts of lithium are substituted for it, the same results are not obtained. Some portion of the beneficial effect is, however, due to the lithium, for the salicylate of lithium is more effective than the salicylate of sodium. The rheumatismal manifestations which resist the action of six and seven grammes (3iss-3ij) of salicylate of sodium yield to four grammes (about 3j) of salicylate of lithium.

To these observations of Prof. Vulpian (*Revue de Thérapeutique*, Jan. 15, 1886), the writer will add that he has found the salicylate of lithium very effective in myalgia or muscular rheumatism, given in the quantity mentioned above—fifteen grains four times a day.

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#### ON SOME POINTS IN CLINICAL THERAPEUTICS.

According to DR. BURNEY YEO (*Lancet*, February 6, 1886), one of the most remarkable gains in the treatment of disease in recent years has been the employment of large doses of iodide of potassium in the treatment of deep aneurisms. In common with many physicians, he has seen more satisfactory results follow this mode of treatment than any other, yet when he first began the use of iodide of potassium in the treatment of aneurisms his results were disappointing, and his belief in the remedy slight. But in the year 1877, on the occasion of the meeting of the British Medical Association at Manchester, he was fortunate enough to see in the infirmary of that city a number of cases of thoracic aneurisms, which had been collected together by Dr. Simpson, for the purpose of showing the members of the Association the value of the iodide of potassium treatment in such cases. It was certainly a remarkable series of cases, and the results were excellent; and it was then he found that whereas in London he and others, who had tried this treatment, had been content with giving five grain doses three times a day, Dr. Simpson had given twenty, thirty, and forty grain doses instead. Now, as soon as he began using these large doses of iodide of potassium in the treatment of internal aneurisms he realized their great remedial value, and he has had the happiness of seeing most admirable results follow the prolonged administration of these large doses. It is only by clinical methods of observation that he could have established a fact of this kind. Many suggestions were made as to the mode of action of the iodide in these cases. The first to be put forward



was that the cases in which the iodide proved of value were syphilitic cases, and that its beneficial effects were due to its antisymphilitic properties. But this view, as Dr. Balfour has pointed out, would only make its action more mysterious. Another suggestion was that the iodide increased the coagulability of the blood, and this it may possibly do; but post-mortem examinations seem to show that the process of cure is obtained chiefly by "some peculiar action on the fibrous tissue," causing thickening and contraction of the walls of the sac. It had been noticed clinically that in some cases under the influence of the iodide, the pulsations in the aneurismal sac and throughout the arterial system were much diminished in force, and this was referred to a reduction in the intra-arterial blood-pressure brought about by the action of the drug. Physiological experiments appear to confirm this view, and to show "that one of the chief actions of iodide of potassium is to lower blood-tension uniformly throughout the body by dilating the arterioles," and, at the same time, diminishing the force of the heart's action.

DR. WILKS, whose skill, caution, and insight as a clinical observer will be universally admitted, has satisfied himself by clinical observation solely that arsenic has the power of preventing attacks of gout and angina pectoris. He is impressed, too, with its remarkable value in relieving some forms of asthma, in certain neuralgias, in cases of anæmia and impaired nutrition, and especially in certain cases of general cachexia of doubtful origin. Dr. Clifford Allbut has also borne unhesitating testimony of its value in the treatment of many forms of visceral neuralgia. Now these observations, the accuracy of which has never been seriously called in question, are due entirely to the clinical method. Let us see what amount of agreement exists amongst experimental pharmacologists as to the action of arsenic. Sklarek considers his experiments to have demonstrated that arsenic impairs sensibility and leaves the motor functions unimpaired; on the other hand, Ringer and Murrell's experiments, it is maintained, prove that Sklarek's conclusions are incorrect, and that motor paralysis precedes the loss of sensibility. Then it has been established, or, at any rate, authoritatively stated, that the effects of arsenic on the circulation are not the same in warm- and cold-blooded animals; so that inferences from observations made on the vasomotor system of cold-blooded animals cannot be applied to the case of mammalian animals, and, therefore, to human beings. The statement of Saikowsky, that arsenic causes fatty degeneration of the liver, kidneys, heart, and other organs, would scarcely have led us to any great enterprise in its application to the cure of disease, nor does it throw any light on the well-known fact that the arsenic-eaters of Southern Austria and Styria, who take enormous quantities, "improve in bodily condition, gain in breathing power, and become stronger and more pugnacious, and also more salacious." Moreover, it has been stated as the result of experimental investigations, that arsenic arrests the formation of glycogen in the liver, and by one observer that it lessens the excretion of urea (C. Schmidt), and by another (Prof. Gätgens) that it causes an actual increase of the amount of urea excreted. Dr. Wilks thinks we may fairly say, with regard to the therapeutic uses of arsenic, that we have acquired more precise knowledge from our clinical method than we could have derived from results of pharmacological experiments.

Another fact in therapeutics which could only have been derived from clin-

ical observation is the much greater efficacy which aconite possesses in arresting or modifying the febrile process in children and young people than in persons of mature age. It is quite remarkable how a few doses of aconite will rapidly subdue the febrile attacks which are commonly associated with local inflammation or other disturbances of health in children and young people, while an expectation of the same results in persons of riper years will be attended by disappointment.

#### PHTHISIS AND ITS TREATMENT BY CARBOLIC ACID.

DR. FILLEAU (*Revue de Thérapeutique*, Feb. 1, 1886) has just communicated to the Société Medico-pratique the facts of an original and efficacious treatment that has given him the best results in advanced consumption—the treatment by carbolic acid. The carbolic acid must be pure, and in white crystals. When it is impure it becomes colored little by little until it is reddish-brown. It then contains rosaline and rosacilic acid, which may be injurious by their coagulant action on albumen. He employs two methods for administering carbolic acid in the treatment of tuberculosis; the hypodermatic and the stomachic. The process by hypodermatic injections has distinct advantages.

The injections made with a solution of pure carbolic acid are inoffensive; they neither cause abscesses, plegmons, nor even simple nodosities. They are little painful, and the patients never refuse them in any case.

The solution which he uses is this:

Distilled water	.	.	.	.	.	.	95 grammes.
Glycerin, neutral	.	.	.	.	.	.	q. s.
Crystallized carbolic acid	.	.	.	.	.	.	1 gramme.

The dose of carbolic acid can be administered without inconvenience up to two grammes (3ss). These injections are made in a quantity of a hundred drops, by means of a syringe holding five grammes; they can be given every two days, or three times a week, according to the indications. He inserts the injection as near as possible *loco dolenti*, except in cases of very marked emaciation. For administration by the stomach, he has recourse to the neutral phenoglycerine, which is very well supported by the stomach, and which is prepared according to the following formula:

Glycerin, neutral	.	.	.	.	.	.	400 grammes.
Crystallized carbolic acid	.	.	.	.	.	.	2 “

A teaspoonful contains 15 centigrammes (about 2½ grains). The dose can be raised to four spoonfuls a day, according to the toleration. Dr. Filleau reports many fortunate cases, which permit him to come to the following conclusions:

The parasitic doctrine of tuberculosis being admitted, one is authorized to consider carbolic acid as the best antiseptic to employ against its manifestations. Carbolic acid is the only antiseptic which, up to the present time, can be administered hypodermatically in large doses during an unlimited time without causing accidents. The tolerance for and harmlessness of carbolic acid administered hypodermatically are clearly demonstrated. Under the influence of this medication, the general state of the patient speedily improves. The local state is at the same time advantageously modified.

The treatment in all cases demands, on the part of the patient and of the physician, long persistence.

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#### INJECTIONS OF ARSENIC IN TUBERCLE GANGLION.

DR. RECLUS publishes the treatment of a case of ganglionic affection of strumous or tuberculous nature by interstitial injections of Fowler's solution, where the result was rapid and the success remarkable.

A person twenty-four years old had, in the subhyoidean region a tumor, which was voluminous, and of woody hardness, formed by two hypertrophied ganglia. Extirpation was decided on, but before attempting it Dr. Reclus advised recourse to arsenical injections. The patient, at the same time, was taking arsenious acid internally, in the daily dose of two to six milligrammes.

Twelve injections of Fowler's solution in the ganglion mass were made with a Pravaz syringe, eight drops the first time, then twelve drops the other times, at intervals of four to five days.

The tumor diminished so rapidly in size that after two months of treatment the submaxillary region regained its normal form, and palpation would have been necessary to find in the place of the tumor a hard mass the size of a pea.

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#### TOXIC EFFECTS OF THE OXYGEN COMPOUNDS OF PHOSPHORUS.

PROF. SCHULTZ has lately studied the toxic effects of the compounds of phosphorus with oxygen (*Archiv für experiment. Pathologie u. Pharm.*, 1885, Heft 1). He included in the examination, hypophosphorous, phosphorous, hypo-, meta-, pyro-, and ortho-phosphoric acids. The preparations used were the neutral sodic salts, and the method of administration consisted in the subcutaneous injection in rabbits.

He ascertained that the hypophosphite had no poisonous action. The phosphite, on the other hand, proved to be an energetic poison, acting especially on the central nervous system and on the abdominal glands. The hypophosphate and the meta- and pyro-phosphate acted as poisons on the stomach and intestines, but the orthophosphate was without toxic power. In fine, the poisonous effects were in an inverse ratio to the number of pairs of oxygen atoms.

The deoxidizing action affects especially the cells, and is more energetic than the oxidizing action. Schultz and Binz, studying this subject in collaboration, had already announced this theory in their examination of arsenic. It is always the oxygen displaced, which effects the changes in the cells acted on. In the same way the therapeutical action of these agents—arsenic, phosphorus, antimony, etc.—is accomplished: "they impart a new vitality to those cells in a feeble state."

Schultz explains in this way the action of the whole series of metallic poisons, which produce the same phenomena in a more or less sensible manner, the variations being due to the differences of their affinity for oxygen. Sometimes there are differences due to the fact that the heavy metals form albuminates, which is not the case with phosphorus and arsenic. But this formation of albuminates does not have the importance of a final phenomenon; it is but a means to an end. In the case of gold, silver, and mercury, it is not oxygen, but chlorine, which brings about the results. It is thus, in the

presence of reducible substances that corrosive sublimate is converted into calomel, and calomel is, on the other hand, transformed into corrosive sublimate. Free chlorine in the presence of water, decomposes it, and it is always the active oxygen thus liberated that brings about the results above indicated. In the case of tin, zinc, copper, and silver, it is not yet exactly ascertained whether oxygen alone, or through the intermediation of chlorine, effects the changes. But all of these substances manifest their powers in the same way, the intermediate process differing with each element; and thus it is that the specific energy of each element is the source of its therapeutical value.

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## MEDICINE.

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UNDER THE CHARGE OF

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### TYPHOID FEVER.

*The hemorrhagic diathesis in typhoid fever.* We can scarcely recognize a hemorrhagic variety of this disease comparable to the malignant form of smallpox, scarlet fever, or measles, in which there are early bleedings from the mucous surface and extravasations into the skin. From the description by Griesinger, however, we infer that he had seen cases of the kind, but more commonly the hemorrhages take place late in the disease, and are not of the uniformly fatal significance of the initial bleeding in other specific fevers.

WAGNER (*Deutsches Archiv für klin. Medicin*, Bd. xxxvii.) records nine cases, of which six proved fatal. In only one instance did the hemorrhage occur as early as the tenth day; in the majority it began from the twentieth to the twenty-third day. The blood came from the gums, lips, nose, bowels, and kidneys, and in some instances was found effused in most of the organs. The cases were usually debilitated or scrofulous individuals. GERHARDT (*Zeitschrift für klinische Medicin*, Bd. x.) records five cases, of which three recovered, and deals fully with this condition. He regards it as a late complication, most likely to be met with in delicate or scrofulous persons, but in some cases dependent probably upon the debility due to prolonged fever, the exclusively animal diet, and perhaps upon the cold water treatment. In fifty-three autopsies in typhoid fever at the Montreal General Hospital (*Canada Medical and Surgical Journal*, vol. xiv.) there were five cases which presented hemorrhagic lesions. In one there had been profuse hæmoptysis a week before death. RAYMOND (*Revue de Médecine*, Nov. 10, 1885) reports two cases, in one of which uncontrollable hemorrhage followed the opening of an abscess in the sacral region, and in the other death took place in the second week from meningeal hemorrhage. In the first case there were found extensive alterations in the walls of the bloodvessels in the neighborhood of the abscess associated with the presence of numerous microorganisms.



*Nephro-typhoid.* Under this term an attempt has been made by certain French writers to establish a "renal form" of typhoid fever, and LONGUET (*L'Union Médicale*, 151-153, 1885) has given a summary of the facts upon which this view is based. Ordinary albuminuria, which occurs frequently in typhoid fever, is, of course, excluded, and the term is restricted to cases in which the symptoms of acute kidney disease develop during the course of the fever. The access is usually sudden, often marked by a chill or chills, epistaxis, headache, delirium, pain in the back, and increase of the fever. With the appearance of the albumen the typhoid condition is aggravated, and the pulse is increased in frequency. The dropsy is usually moderate. The urine is dark colored, and may contain much blood, with epithelial débris and casts. The prognosis is grave; death takes place from asthenia, or, in some cases, with uræmic symptoms. The lesions met with in the kidneys have most frequently been those of diffuse parenchymatous nephritis, and present nothing distinctive. A difficulty in diagnosis arises from the fact that there are instances of renal congestion with marked typhoid symptoms. Such a case is described by A. ROBIN (*Gazette Médicale de Paris*, 1885), in which stupor, dry tongue, and diarrhœa were prominent features; but the early fall of temperature and the absence of spots forced the conclusion that it was nephritis, with the so-called typhoid symptoms. In spite of the absence of pathological evidence, Longuet is induced, on clinical grounds alone, to recognize a form of typhoid in which there are pronounced renal symptoms, the expression of the direct action of the poison on the kidneys.

WAGNER (*loc. cit.*) reports five cases in which acute hemorrhagic Bright's disease developed with the typhoid fever, but did not appear to modify to any great degree the course or duration of the affection. The pulse was perhaps accelerated, and dirotism was usually absent; sometimes the tension was increased. He holds that the existence of a nephro-typhoid as a distinct form cannot be established until it is shown that the renal affection is specific and dependent upon the action of the typhoid poison. TOUSSAINT (*Archives de Méd. et de Phar., Milit.*, No. 18, 1885) divides the renal complications of typhoid fever into three groups: (a) the albuminuria of the onset; (b) albuminuria in the course of the fever; and (c) albuminuria during the convalescence. In the determination of the nature of the albuminuria, whether due to the existence of Bright's disease or merely to the circulatory or febrile disturbances, this author places great reliance on the presence of the so-called retractile form of albumen, which, with acid and heat, floats as firm flocculi in a clear fluid. Bouchard regards this as a certain indication of the existence of nephritis, while the albumen, which remains in suspension or produces simply opalescence with heat and acid (*albuminurie non-retractile*) is due to the dyscrasia or febrile disturbance. The renal lesion results from the irritation caused by the microorganisms of the disease, which Toussaint claims have been demonstrated in the glomeruli and tubules.

*Pneumo-typhoid.* GERHARDT (*Berliner klin. Wochenschrift*, 41, 1885) discusses briefly the relations of pneumonia and typhoid fever, and is inclined to regard the cases as examples of double infection, and not as instances of the special local action of the enteric poison on the lungs. He recognizes two groups of cases. A true pneumonia may set in with chill, etc., in a patient who has been ill some time with typhoid fever. The temperature is

elevated, and the complication is necessarily one of great danger. Should the patient succumb, healing ulcers are found in the ileum and fresh croupous pneumonia in one or more lobes of the lungs. In such cases we have occasionally the opportunity of seeing herpes and jaundice, which are rare symptoms in uncomplicated typhoid. In other cases the two diseases set in together, with an intimate commingling of these symptoms, and as hybrid plants sometimes resemble one parent, sometimes the other, so in these cases the pneumonic symptoms may be marked, or again the typhoid features predominate. The onset is usually with a chill or chills, but the patient may continue at work for several days. The lung symptoms develop within the first week, and are pronounced—pain in the side, shortness of breath, cough, bloody sputa, and signs of consolidation. Pain in the head, dulness, pain in abdomen, diarrhoea, and enlargement of the spleen may early suggest the existence of a second disease. In eight cases the typhoid rash was absent only once. Diarrhoea was an early symptom. The general typhoid symptoms frequently set in in the second week. The temperature may fall by crisis, or there may be pseudocrises, after which the fever rises and continues. The prognosis is good. Gerhardt lost only one case in ten years in hospital practice. While suggesting that these cases are due to a double infection with the typhoid bacillus and the pneumonococcus, he admits that future investigations can alone decide the question. This is virtually the position of WAGNER, of Leipzig, whose contribution to the etiology and pathology of pneumo-typhus in *Deutsches Archiv für klin. Med.*, Aug. 1884, is the most important which has appeared during the past few years.

*Peripheral neuritis in typhoid fever.* PITRES and VAILLARD (*Revue de Médecine*, December, 1885) report two cases of paralysis of the ulnar nerve during convalescence from typhoid fever. Atrophy of the muscles followed in spite of treatment. The condition was attributed to a peripheral neuritis such as was demonstrated to exist in a similar case by Bernhardt. In four cases of typhoid in which there were no special symptoms pointing to neuritis, changes were found in the peripheral nerves. They draw the following conclusions: 1. Among the various nervous affections which may develop after typhoid fever, are the peripheral neuritis leading to paralysis of limited groups of muscles, accompanied with pain or anæsthesia, rapid diminution of the electrical excitability, and wasting of the affected muscles. 2. So far, the neuritis has been demonstrated in only one case—that of Bernhardt—but its existence is shown by the analysis of the symptoms and the course of the paralysis. 3. Histological examination shows that in persons dead of typhoid fever, the peripheral nervous system is often the seat of parenchymatous neuritis. When these changes are not very advanced they may be latent or give rise to only ill-defined symptoms, but when more severe they become manifest as the sensory, motor, and trophic disturbances characteristic of peripheral neuritis.

*The state of the reflexes in typhoid fever.* ANGEL MONEY (*Lancet*, Nov. 7, 1885) finds the knee-jerk much exaggerated and the muscular irritability greatly increased. When the knee-jerks are very marked, spontaneous fibrillary contractions of the muscles occur, and spontaneous contractions of the whole or nearly the whole of the muscle may occur, known as "subsultus tendinum," and with this degree of irritability the ankle clonus may usually

be obtained. The cutaneous reflexes are also increased. These phenomena come on usually in the second week of the disease, gradually increase until the subsidence of the fever, and do not disappear for two or three weeks after convalescence has set in.

*Berlin statistics.* SENATOR has compared (*Berliner klin. Wochenschrift*, Nos. 45 and 46, 1885) the results of treatment of typhoid cases in the eight Berlin hospitals for the ten years 1875–1884. The Charité and the two city hospitals are excluded, as the patients admitted to them are from the lowest classes, and the mortality is high, being for the Charité, 16.4 per cent.; Friedrichshain, 19.6 per cent.; and the Moabit, 15.2 per cent. In the others the death-rate was as follows: Hertwigs, 14.7 per cent.; Elizabeth, 12.8 per cent.; Lazarus, 14.1 per cent.; Bethanien, 13.5 per cent.; and Augusta, 12.3 per cent. Of the last institution Senator is the medical director, and he shows clearly that the low mortality is not due to favoring conditions of age, sex, or rank of the patients. While in the other hospitals an antipyretic plan of treatment is more or less strictly carried out, and cold baths are frequently given, in the Augusta Hospital the cold water treatment has not been employed, and no methodical antipyretic treatment followed. Senator is not opposed to the cold bath, but he thinks its value as an antipyretic overrated, and not equal to quinine or antipyrin. Its special use is in cases with early stupor and profound nervous symptoms.

Senator's experience is very much in favor of the expectant or symptomatic plan of treatment in typhoid fever, and it is all the more valuable coming from a quarter where the treatment of the disease was becoming largely a matter of antipyresis.

*Munich statistics.* BUTZ (*Deutsches Archiv f. klin. Med.*, xxxvii.) reports the results of treatment of 899 cases of typhoid fever treated in Von Ziemssen's Clinic, at Munich, from 1878–1883, inclusive. There were 88 fatal cases—9.78 per cent. The mortality in different years ranged from 2.3 to 18.6 per cent. There were 112 cases of relapse, of which 108 happened in the years 1878–1881. The treatment consisted in cold baths and the use of quinine, salicylate of soda, cinchonin, and antipyrin. Cinchonin produced unpleasant collapse and heart-weakness, which ended fatally in two cases.

*Typhoid in animals.* DR. BLAND SUTTON (*Transactions of the Pathological Society of London*, 1885) has made some interesting observations which go to show the existence of an enteric fever in lemurs, monkeys, and beavers, resembling closely in clinical and anatomical features human typhoid. The etiological connection, however, is still doubtful. As is well known, inoculations in animals with typhoid material have heretofore proved negative. The so-called typhoid fever of the horse, in which the lesions are very distinctive, is stated by one of the latest writers on the subject (Servolles) to be different from the human disease.

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#### ALCOHOLIC PARALYSIS.

In a monograph of 110 pages OETTINGER ("Sur les Paralysies Alcooliques," Paris Thesis, 1885) gives an extensive and lucid description of alcoholic paralysis. Magnus Huss receives the credit of having been the first to describe this affection. In 1881, Lancereaux published several observations that he had



made, and for the first time clearly indicated that alcoholic paralysis was dependent upon lesions of the peripheral nerves.

The symptomatology is very fully considered. The paralysis is stated never to set in brusquely, but is always preceded by premonitory symptoms, such as disturbed sleep, terrifying dreams, delirium tremens, cerebral troubles, various digestive derangements, lightning pains, and the sensation of burning and tingling in the lower extremities. The latter come on especially toward night, and cause great suffering. At the same time may be noticed a transient œdema of the hands and feet, localized principally on the dorsal surface; cramps and subsultus of the muscles are also common. The motor affection may be of varying intensity, and is divided, according to its degree, into paresis and paralysis. Paresis is the most frequent form, and may only be evident to the patient as a weakness or feeling of lassitude in the legs. These symptoms are more pronounced in the morning on rising, vary considerably from day to day, and undergo considerable exaggeration on the occurrence of febrile attacks or gastric derangements, to which the patients are subject.

Paralysis usually develops slowly and progressively, but it may also develop rapidly, and soon become general. It is necessary to remember, however, that the paralysis is never general at the outset. In the most acute case, that recorded by Broadbent, it took more than three weeks to become general. The paralysis is never complete, and even when the muscles will no longer respond to the faradic current they are still capable of exercising some movement. The muscles are not all equally affected, and, like other toxic paralyses, certain groups of muscles are more likely to be affected than others. The extensors of the big toe are the first to be involved; but it must be mentioned, however, that the flexors do not escape. The paralysis may be limited to the inferior extremities, and this is the most common form. If the paralysis extends to the upper extremities, the extensors, as in the legs, are the first to be affected. A singular feature of the paralysis is, that it does not attack the muscles of the face, even when it becomes general. The absence of visceral disturbances warrants the inference that the paralysis does not affect the sympathetic nerves.

The author does not think that alcoholic ataxia deserves to be considered as such. He regards it as a complement of the paralytic phenomena. He does not agree with Wilks that the paralysis may be accompanied by contractions; the muscles, he says, are always flabby and flaccid.

Hand in hand with the paralysis proceeds atrophy of the muscles, which Oettinger considers as secondary to the paralysis. The author's results with electricity coincide with those of Dreschfeld and others. In common with other writers, he draws attention to the hyperæsthesia, with impairment of the tactile sense. When the muscular paralysis is profound, anæsthesia often replaces the hyperæsthesia. Much importance is attached to the vasomotor and trophic disturbances. These consist in transient redness of the skin, profuse localized sweatings of the back, the dorsal surface of the hands and feet. Œdema of the legs is very common, and in the graver forms of paralysis is never absent. Purpura is relatively rare. Trophic disturbances are manifested by the shining appearance of the skin, the brittle, glistening state of the nails, and the hypertrophy of the cellular tissue of the skin, which renders the latter brawny and indurated.



The pathological anatomy of the nerves was studied after Ranvier's method. The alterations in the nerves observed resembled those following the section of a nerve. There was increase of the cellular nuclei, tumefaction of the protoplasm, and breaking up of the myelin into lumps. Later on, the axis-cylinder breaks up, and after a time disappears, whilst the myelin becomes gradually absorbed. In an advanced stage the nerve is reduced to its sheath, all of its nervous elements having disappeared. These changes may be observed in the nerve trunks in parts, but are best seen in the nerves furthest from the centre. The author does not think that we can, as yet, answer the question, how high the lesion extends. Whether the lesion starts in the motor end-plates, or in the terminations of the sensory nerves, he thinks, must remain, for the present, an unsolved question. He holds that the change is limited to the parenchyma of the nerve, though Hadden reports a case in which he found interstitial neuritis. To decide the question whether the motor or sensory nerves are most implicated, will require a greater number of anatomical examinations than has, as yet, been made.

The branches going to the skin particularly show the pathological changes in an exquisite degree. These become converted into fibrous cords, the sheath being the only structure of the nerve remaining.

In one of the author's cases the sensory nerves showed an advanced degree of the pathological change which explained the anæsthesia that had been present prior to death. Yet the author is of the opinion that the motor nerves were the most implicated. In all the cases examined, the anterior and posterior medullary roots have been found healthy. The same remark applies to the medullary substance of the cord. It is natural to conclude, therefore, that the lesion in alcoholic paralysis lies in the peripheral nerves.

The muscles appear of smaller volume, paler color, and of more friable consistence. The striæ are less visible, less distinct, and in some cases the muscular substance undergoes granular degeneration. These changes are not extensive, however, for a great number of the fasciculi were found quite healthy among the diseased ones.

Among the pathological changes in the organs worthy of mention, is the frequency with which tubercle of the lungs is met with. The tubercles are characterized by their abundance and confluence rather than by their tendency to the formation of large excavations. Acute affections of the lungs are common, and frequently carry off the patient. The author concludes that all the phenomena observed in alcoholic paralysis can be physiologically explained by a lesion of the peripheral nerves without implication of the cord. Regarding the etiology, it is noteworthy that in England at least seventy-five per cent. of the cases have occurred in women, in whom delirium tremens is less frequent than in man. But in other countries this disproportion in the sex has not been observed. Of the eight cases published in Germany, all were men. Only the strong liquors, especially those of poor quality and containing much fusil oil, are capable of producing paralysis. Wine-drinkers do not suffer from this disease. Wilks and Lancereaux hold that the essential oils contained in the liquors are the toxic agents. Two cases reported by Lancereaux strongly confirm this view. The cases occurred in two women who had lived night and day, for a long term, in shops containing methyl- and amyl-alcohol in wooden

and other vessels. They suffered from typical alcoholic paralysis, though they neither drank alcohol in any form.

The monograph contains the clinical records of sixteen cases, including the cases hitherto unpublished in France, and some of the published cases of other countries, but which had not, as yet, been published in France.

In an article of considerable length (*Neurol. Centralb.*, Nos. 19, 20, 21, 1885) DR. RICHARD SCHULZ gives a critical review of our existing knowledge of alcoholic paralysis, together with a detailed report of a case that came under his observation. The patient, aged thirty-three, who had been a very hard drinker, was admitted into the hospital on September 16, 1884. Though quiet, his mind was so confused that nothing could be obtained about his history. Later on, as his mind grew clear, the following facts were elicited: that his parents were living and healthy; that no neurosis existed in his family; that the patient himself lived irregularly and drank hard, in consequence of which he had had several attacks of delirium tremens. His present illness began at the end of August, 1884, with dizziness, and weakness in the lower extremities, which rapidly increased.

The following is a brief synopsis of the record during the patient's stay in the hospital. At first he lay in a state of apathy, complaining of seeing objects, and muttering nonsense to himself. There was marked convergent strabismus, the paralysis being most marked on the right side. Pupils were moderately narrow, equal, and reacted fairly well to light. On endeavoring to make the patient stand, his legs gave way from under him. The muscles of the extremities were markedly emaciated. Sensibility was apparently intact. The patellar reflex was absent, the abdominal and plantar reflexes were perhaps exaggerated. The patient passed stools and urine in bed, and lay in a semi-confused state, at times giving intelligent answers to questions. Nine days after admission, an examination with electricity was made, which showed marked diminution of the electrical irritability of the nerves and muscles without any qualitative changes. On the 29th of September, thirteen days after admission, the patient complained for the first time of pains in the arms and legs. On the 4th of October a slight degree of fever was present, which reached as high as 40.2° C. Several of the joints were swollen and red. These symptoms disappeared under the administration of salicylate of soda. November 9th, improvement began to be manifest; the patient became reasonable, and the patellar reflex could be slightly elicited. The ischiatic and brachial nerves now gave evidence of considerable tenderness on pressure. Seventeen days later reaction to the faradic current exhibited itself. From this time on, the patient made a gradual but steady recovery, and was discharged on the 16th of March as cured. Measurements of the extremities at this period showed that they had increased 2 cm. (1½ inches) in circumference.

Commenting on the case, Schulz says the diagnosis was particularly difficult. Progressive paralysis could not be excluded at first. The diagnosis of poliomyelitis anterior appeared to be most plausible. The author would attribute the involuntary passages of the stools and urine rather to the patient's mental condition than to a paralysis of the nerves supplying these parts. As the patient's mind grew clearer, Schulz became convinced that the affection was one of multiple neuritis. He bases his diagnosis on the following facts: the multiplicity of the processes which had affected the nerves of the extremities

and the abducens; the high degree of atrophy, with the marked diminution of the electrical irritability without any qualitative changes; the slight disturbances of sensibility; the absence of the tendon reflexes, the superficial reflexes remaining normal; and the tenderness, on pressure, of the great nerve trunks. In favor also of the diagnosis was the return of the electrical irritability and the termination in recovery on the withdrawal of alcohol. To meet the objection that the disease might have been due to a central lesion, cases published by other authors are quoted which had presented a similar train of symptoms, and in which an autopsy revealed a normal cord with degeneration of the peripheral nerves.

Schulz agrees with Dreschfeld and Strümpell that there are two forms, one with a predominance of the ataxic symptoms with very little paralysis, the other with marked paralysis. It is important from a prognostic point of view to differentiate alcoholic ataxia from tabes. The differential diagnosis lies in the relatively more rapid course, in the earlier appearance of atrophy, which is a very late symptom in tabes, and in the marked diminution of the electrical irritability. Further points of differential diagnosis are, as Strümpell has stated, the absence of the Argyll-Robertson pupil, the girdle sensation, and disturbances of the bowels and bladder. A slight degree of fever is present in nearly all of the alcoholic cases.

The pathology of these cases is far from being settled. Many neurologists are of the opinion that the affection is not a pure multiple neuritis; they say that the cord also is affected. Schulz believes that the pathological changes are limited to the peripheral nerves. The vacuole formation in the ganglion cells in the anterior horns of the cornu, which has received so much attention recently, he considers as an artificial formation and not a pathological change. Charcot is quoted as being of the same opinion.

At the conclusion of the paper eleven cases by various authors are given in tabulated form. An analysis of these presents the following facts: Five died, four were cured, and two were improved. Of the five cases that terminated in death an autopsy revealed degenerations of the peripheral nerves in all, while the cord was found normal in each case. No mention is made of the condition of the brain and its membranes. The other phenomena resemble, for the most part, those in the author's case as described above. It may be of interest, however, to note the electrical reaction. In six cases the faradic reaction of the muscles was diminished, in three it was extinguished, in one it was fair, and in one it was not stated. The galvanic current showed the reaction of degeneration present in five cases, in ten other cases the current called forth slow and vermiform contractions of the muscles.

DR. J. DRESCHFELD contributes a valuable article in *Brain*, January, 1886. In a short historical review, the honor of priority in the description of the disease is accorded to an American writer, Dr. James Jackson, who wrote of this affection as early as 1822. Dr. Jackson's clinical description is most true to nature, and Dreschfeld quotes from it at some length.

The author, according to the more prominent symptoms, divides the affection into two groups, the alcoholic ataxia and the alcoholic paralysis. In one there is marked incoördination with little or no paralysis, in the other there is decided paralysis, and the ataxia is in a measure dependent upon the paralysis. Dreschfeld considers the ataxic form as a far milder type, although



the pathological change is the same—a peripheral neuritis. He has observed three cases of this form, two of which recovered, whilst the third died from uræmia due to a contracted gouty kidney.

The paper embodies a report of three of these cases. In the first case there were no mental symptoms whatever, in the second the patient was irritable and lost his memory for recent events. The latter symptom was still present when Dreschfeld saw him a year after the onset of his illness. The mental condition of the third case is not stated. This was the one that proved fatal. At the autopsy the brain and cord were found normal. The sciatic nerve, which had been preserved for microscopical examination, showed a moniliform state of the nerve tubes due to breaking up of the myelin, the nuclei were increased, and there was also some interstitial cell infiltration. Transverse section showed, in some places, an increase in the diameter of the axis-cylinder, and some interstitial infiltration. The muscles exhibited chiefly increase of the muscle nuclei and an interstitial deposit of small round cells, and in some places the striation was not well marked. The kidneys were found small and highly granular, and the heart greatly hypertrophied.

Four cases are reported of the second group in which the paralysis predominates over the ataxia. Considerable stress is laid on the mental condition in these cases, which, the author thinks, is quite characteristic. The patient's memory is usually very defective, and they are the subjects of a strange delusion. They are oblivious to the circumstance that they are confined to bed, and fancy they take long walks. One of Dreschfeld's patients said she went out every afternoon for a walk to the seaside, which was at least twenty miles from her residence. In three of the cases considerable atrophy accompanied the paralysis. In addition to the above, the patients suffered for the most part from the following symptoms: "lightning pains" in the extremities, muscular hyperæsthesia on firm pressure, anæsthesia of the skin, loss of the tendon reflexes, the superficial reflexes remaining normal. In only four of the patients was an examination made by electricity. This displayed with the galvanic current a greater or less degree of degenerative changes of the muscles. Nothing is said of the electric reaction of the nerves. Regarding the pathology of these cases, the author merely states that, in his opinion, it is a neuritis of the peripheral nerves.

Alcoholic paralysis formed recently the subject of one of LANCEREAUX's clinical lectures (*L'Union Médicale*, July 14, 1885). A short and sketchy outline of the clinical aspect of the affection was given. He divided alcoholic paralysis into three forms according to its development. In the first form, the paralysis develops rapidly and progressively. It has a tendency to become general and prove fatal. The clinical features resemble those of subacute myelitis. In the second, the development is subacute, the paralysis has a tendency to retrocede and become cured. The third form pursues a very chronic course, and usually the inferior extremities only are affected. It commonly terminates in cure.

A case was presented exhibiting the characters belonging to the second form. A noteworthy feature of the case was that the paralysis affected, in the main, the extensors of the legs and arms. The paralysis was preceded for a long time by pricking sensations and shooting pains in the legs. At the time



of the patient's admission into the hospital, the tactile sensation was notably diminished, though there was hyperæsthesia of the anterior surface of the legs and upper surface of the forearms.

Lancereaux favors the view that the pathological change involves the peripheral nerves only. He has had several fatal cases; in all, the brain and cord were found normal, but the nerves showed the same change that a nerve does after section. He recommends the following treatment: chloral and opium during the restless stage; after the nervous system has been quieted, every endeavor should be made to tone the system. He puts great faith in hydrotherapy to accomplish this. Electricity he advises, on account of the atrophy, but does not think it has any influence upon the regeneration of the nerves.

DR. THOMAS BUZZARD, in the Harveian Lectures of 1885, on the subject of some forms of paralysis dependent upon peripheral neuritis (*Lancet*, December 19, 1885), touches upon the question of alcohol, independent of gout, as being the cause in some cases of peripheral paralysis. He says: "Alcoholic cases are occasionally met with in which there is paralysis to a considerable extent, which has escaped the notice of the patient's friends. The patient (usually a female) lies in bed in such a muddled condition of mind that she does nothing for herself, and takes sustenance at the hands of others. When moved from side to side, in bed, or when her limbs are touched, she cries out with pain." He goes on to say that there is wasting of the extremities, the kneejerks are absent, the faradic excitability in the muscles is greatly reduced or lost. The prognosis of these cases is somewhat doubtful, as in them the brain also is always more or less involved. But from personal experience, Buzzard is disposed to give a very favorable prognosis, even in cases that are marked by extensive paralysis and muscular atrophy.

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#### HEMIANOPSIA AND THE VISUAL CENTRE.

At the stated meeting of the New York Neurological Society of the 8th of October, 1885, DR. E. C. SEGUIN read an important paper on the pathology of hemianopsia of central origin (*The Medical News*, Nov. 14, 1885). A brief synopsis was first given of the peripheral varieties. Lateral hemianopsia, or, as it is often called, homonymous hemianopsia, in which the nasal half of one visual field and the temporal half of the other are dark, so that with one or both eyes open the patient sees the same half of any object placed before him, results from a central lesion. The author analyzed the recorded observations of hemianopsia due to cerebral lesion, 42 in number, including the author's own cases; of these, 37 were medical and accompanied by autopsies, 5 were surgical and were followed by the survival of the patient. These relatively numerous observations were classified as follows: (a) Cases of lateral hemianopsia, 34 in number, indefinite or irrelevant, and useless for localization and study; (b) cases of lateral hemianopsia from lesions of parts of brain not directly related to the optic apparatus, 3 in number; (c) cases of lateral hemianopsia from lesions involving chiefly the thalamus opticus or corpus geniculatum laterale; (d) cases of lateral hemianopsia from lesions chiefly or exclusively involving the white substance of the occipital lobe; (e) cases of lateral hemianopsia of external or traumatic origin; (f) cases of lateral hemianopsia due to lesions involving the cortex of the brain and sub-jacent white substance.

Dr. Seguin considered the last category as being by far the most important for the study of the localization of the visual centre in man, and gave full abstracts of the recorded cases. The lesions in all were so placed as to cumulate toward the mesial aspect of the occipital lobe. By means of a shaded chart, the position of the lesion in the thirteen cases was represented. This was found to be upon the mesial aspect of the cerebrum, including the lower part of the cuneus and the fifth temporal gyrus. To this locality also was limited the lesion found in the following cases: Haab's, Huguenin's, Téré's, and Seguin's. These were single lesions, and no paralysis or anæsthesia had been observed during the patient's life—only hemianopsia.

Dr. Seguin's own case was as follows: A man, aged forty-six, affected with malignant endocarditis (mitral vegetations), which proved fatal in sixteen months from first observation in January, 1884, through repeated visceral embolism. The case also exhibited for many weeks prior to death an exquisite intermittent form of fever closely imitating malarial intermittent. About December, 1884, the patient suddenly complained of blindness of the left eye and slight numbness through the whole left side of the body. He strongly insisted then, and frequently thereafter, that his left eye was alone affected, because he could not see to his left. Examination showed well-defined left lateral hemianopsia, the vertical line passing a little to the left of the point of fixation. In a short time the numbness passed away, but the hemianopsia persisted until death. The patient was able to read and write easily for many months before death, in spite of the hemianopsia. The lesion found at the autopsy was a large old patch, of yellow softening, involving the greater part of the right cuneus, almost reaching the apex of the occipital lobe and the fifth and fourth temporal gyri, extending also into the gyrus hippocampus. This lesion was found to be a blockade of the occipital branch of the posterior cerebral artery. The white matter was involved to a depth of several millimetres. The process of hardening the brain for examination was unsuccessful in part, and only the occipital end of the brain became hard. The absence of decided motor and sensory symptoms during life, however, made it quite certain that there were no other gross lesions in the brain.

From these data and others, Dr. Seguin considered it as well proven that the visual centre in man is in the cuneus and adjacent gray matter below it. A destruction of this part of the hemisphere inevitably produces lateral hemianopsia of the field on the opposite side of the body. To explain the few cases in which the lesion causing hemianopsia is situated upon the lateral aspect of the hemisphere, in the inferior parietal lobule, and the gyrus angularis, one must remember the course of the optic fasciculus of Gratiolet and Wernicke on its way from the optic centres. This passes close under these gyri, and a lesion that penetrates at all beneath the gray matter of the cortex must intercept, by pressure or by destruction, the optic fibres. These are lesions intercepting communication between the eyes and the visual centre, while lesions of the mesial aspect of the occipital lobe destroy the centre itself.

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#### MENTAL SYMPTOMS IN URÆMIA.

In a critical review on uræmia GIRANDEAU (*Archives Générales de Médecine*, January, 1886) gives an interesting account of the mental symptoms which

may develop in the course of chronic Bright's disease. This *folie brightique*, as Dieulafoy calls it, presents very diverse features. Sometimes it comes on as violent delirium or acute mania, with hallucinations of sight and hearing. In such cases the existence of renal disease may not have been suspected, and the symptoms come on suddenly. An instance of this kind came under our notice a few years ago, and is reported in Seguin's *Archives*, 1882. Sometimes the patient becomes melancholic, and meditates suicide and loses interest in the affairs of life. The idea of persecution may exist, the patient may fear poison and refuse to eat, more rarely it takes the form of religious or erotic mania. These forms may exist alone or follow each other, and occasionally are combined. The duration is variable; the acute delirium may be quickly succeeded by coma and death, but the condition may last in some cases for weeks or months, as in a patient we had an opportunity of seeing last year with Dr. Mullin, of Hamilton, Ontario, in whom the mental alienation persisted for over two months, and ended in complete recovery. The question has been considered in its relation to testamentary capacity by Dr. Stephen Rogers (*Medico-Legal Society of New York Papers*, Series ii., 1882).

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#### URÆMIC EPILEPSY AND HEMIPLEGIA.

CHAUTERNESSE and TENNESON (*Revue de Médecine*, November, 1885) have made careful studies of local (Jacksonian) epilepsy and hemiplegia in Bright's disease which are of special interest, as they prove that these conditions may be induced by local œdemas of the brain. In four cases of hemiplegia which presented the usual characters of unilateral paralysis from hemorrhagic lesions, the autopsies showed only an intense serous infiltration. Of two cases of partial epilepsy one proved fatal, and the most careful search failed to demonstrate the existence of any local lesion other than the intense œdema.

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#### ACTINOMYCOSIS.

DR. JAMES ISRAEL, to whom the profession is indebted for the first description of this disease in man, has published an important monograph (*Klinische Beiträge zur Kenntniss der Actinomykose des Menschen*, Berlin, 1885) in which all the cases are carefully studied and arranged in groups, according to the supposed mode of entrance of the parasite. Thirty-eight cases are analyzed; a considerable material when we think that scarcely eight years have passed since the affection was first recognized.

Three groups of cases can be recognized according to the mode of entrance of the parasite, by the mouth and pharynx, by the air-passages, and through the intestines. In the first group, comprising seventeen cases, the disease was localized in the lower jaw, the submaxillary region, the neck, and retro-pharyngeal region about the cervical spine and base of the cranium. It seems probable that in all these cases, as in cattle, the disease originates in diseased teeth, as there was affection of these parts in fourteen or fifteen cases of this group, in which the condition of the teeth and jaws was noted. In an unreported case of Israel's, there was a central actinomycotic process in the lower jaw identical with the "big jaw" of cattle. In a few instances the disease appears to have begun on the tongue or tonsil, but it seems clear



that, in the majority of cases in which the mouth and neck are affected, the process begins by an invasion of the parasite in diseased teeth.

To the second group of cases, pulmonary actinomycosis, Israel makes the most valuable contributions, and we feel that he has added a new and formidable disease to the already long list of lung affections. Of nine cases, in one, that of Cantani, the process was limited to the bronchial mucous membrane. In the others the lung tissue was involved. The clinical picture is complex. The process is chronic, and may exist a year without severe symptoms. The sputum contains the yellow actinomycotic granules, and is so far characteristic. Peribronchitic and pneumonic changes are excited in the substance, and cavities ultimately form. The disease tends to extend to the pleura, excites empyema, involves the costal layer, and has, in many instances, caused necrosis of the ribs and external fistulæ. The prevertebral tissues become involved with caries of the spine. The peritoneum may be affected through the diaphragm, and the mediastinum and heart have been involved in some cases. In addition to this direct extension in pulmonary actinomycosis, there have been, in these cases particularly, numerous metastases which impart to them the clinical aspect of a chronic pyæmia. Skin, muscle, heart, liver, intestines, and brain, have been found the seat of actinomycotic abscesses. The course of the disease has ranged in the cases from five to twenty months.

In the third group the disease begins in the intestinal tract. It may be, as in Chiari's case, superficial and confined to the mucosa, producing large, flat plaques, but more commonly it starts in the substance as nodular actinomycotic growths, which suppurate and induce ulceration. The ulcers may be most extensive, and the process may extend to the serosa. By adhesions taking place between the coils and perforation of the ulcers, a series of communicating abscesses may be formed. The peritoneum has been found extensively involved, and the pus may penetrate externally, or burrow in the retroperitoneum.

In a fourth group are placed five cases in which the mode of entrance of the parasite remains doubtful. Four of these there were prevertebral abscesses, and in the fifth there was an actinomycotic abscess in the right Fallopian tube.

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## SURGERY.

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### IN EUROPE.

#### UNDER THE CHARGE OF

FREDERICK TREVES, F.R.C.S.,

SURGEON TO, AND LECTURER ON ANATOMY AT, THE LONDON HOSPITAL.

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#### RECENT SURGICAL LITERATURE.

The last-issued parts of the *Dictionnaire Encyclopédique des Sciences Médicales* consist of three volumes. In the first of these ("Ebe to Eco") the only articles of surgical interest are "Ecchymose," by A. Dechambre, and "Écoles," by Alexandre Layet. The former is a contribution of no note. It contains



nothing new, and cannot even be said to represent the knowledge furnished by the literature of the day. The latter article is an elaborate and most valuable monograph, and forms an exhaustive treatise upon school hygiene. The question of school desks and school seats is fully considered, and the subject of lateral curvature of the spine is entered into at some length—indeed, this portion of the article forms an important contribution to the etiology of lateral curvature. The effects of posture upon the sight, and the defects of vision that appear to be incident to school-life, occupy some space. The second of the volumes (“Eco to Egu”) is occupied mainly by the articles “Eczéma” and “Égouts.” The only monograph of surgical interest is that on “Écrasement,” by André Boursier. The paper is well written, although somewhat verbose, and is probably the most complete treatise upon the *écraseur* and its uses that any literature possesses. It concludes with an excellent bibliography. The various instruments are described, and many are figured. The mechanical effects of “*écrasement*” upon the tissues is dealt with at some length, and the article contains much original matter. It is pointed out that, as regards the arteries, the external coat is greatly elongated and is drawn out into a thin thread, while the internal and middle coats are divided abruptly, and become turned in, so as to occlude the lumen of the vessel. The various accidents that may attend the use of the *écraseur* are dealt with, and a great deal of space is taken up with the indications and contraindications for its use.

LÖBKER'S work on *Operative Surgery* (*Chirurgische Operationslehre*, Wien, 1885) is now complete. It is intended to illustrate a course of operative surgery as practised upon the dead body. It is one of the best and most concise manuals of its kind. The descriptions are brief and practical, and the anatomical details of the various operations are fully discussed. The illustrations are numerous and of a high order. In addition to the operations that are usually dealt with in a practical course upon the cadaver, Löbker describes a number of operations that could hardly become a part of such a course. Such are the radical cure of hydrocele and of hernia, plastic operations, and the like. The descriptions given of these procedures are so very brief that they must prove to be of doubtful value.

Volume 3 of POULET and BOUSQUET'S *Traité de Pathologie Externe* (Paris, 1885) has appeared, and deals with the abdomen, the genito-urinary organs, and in part with the limbs. This volume maintains the character of the preceding part of the work. It is a compilation merely, but at the same time a very good and useful compilation. The authors make more use of German and English material than is usual among French writers on medicine. The pathological and clinical sections of the book are very good, while the sections that deal with treatment are equally bad. Indeed, so little space is devoted to the question of treatment that it is a pity that the whole subject had not been omitted. In many departments, such as that dealing with the radical cure of hernia, the authors are far behind the time in therapeutics.

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#### NEW WOUND DRESSINGS.

PROF. JOHN WOOD (*Brit. Med. Journal*, Dec. 12 and 19, 1885) reviewed, in his Bradshawe Lectures, the use of antiseptics, and stated that he had obtained

good results with dilute solutions of peroxide of hydrogen and nitrate of silver. The former is of course an unstable compound, and if used for wounds should be protected by gutta-percha tissue, or mixed with some mineral antiseptic. It has the advantage of being perfectly innocuous.

Since May, 1833, PROF. FISCHER (*Zeitschrift für Chir.*, xxii. Hefte 3 und 4) has employed powdered sugar (itself a feeble antiseptic) in combination with corrosive sublimate as a dressing, also using the carbolic spray and sublimate solution for certain operations. Stomatitis was frequently seen as a result, and one case of fatal hemorrhagic nephritis occurred. The urine in most cases was somewhat red, fluorescent, and contained altered urobilin. The powder can be left on the surface of the wound for many days, and Fischer values it highly as favoring primary union and preventing infection from without.

Bisulphide of carbon in dilute aqueous solution has been lately recommended by several (including M. Pasteur) as an efficient and safe antiseptic.

DR. SCHELLER (*Deutsche Zeitsch. f. Zahnheilkunde*, 1885, Heft 5) has found it useful in dental surgery, and in checking suppuration in the mouth and nose.

DR. GALEZOWSKI (*Lancet*, Jan. 2, 1886) employs thin gelatine plaster impregnated with a minute quantity of sublimate and of cocaine, to secure primary union in incisions made in the eye (cataract extractions, etc.). He holds that the normal tears contain microbes, and has even successfully operated for cataract complicated by dacryocystitis with the aid of the protective plaster.

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#### TUBERCULAR INFECTION OF WOUNDS.

PROF. KRASKE (*Centralblatt*, Nov. 21, 1885) deals with this novel subject in a valuable communication. König, in 1882, recorded a case in which there was reason to suspect tubercular infection of a wound made for osteotomy of one tibia. The granulations became swollen and unhealthy, and at the boy's death, three months later, the autopsy showed tubercular changes in the bone and inguinal glands, as well as miliary tubercle in the liver, lungs, etc. This case, however, as König admitted, is open to another explanation. Both of Kraske's patients were boys, aged about ten years, in each case with a strong family history of phthisis; both were the subjects of what the author regarded as acute osteomyelitis of one femur, leading respectively to caries and to necrosis of part of the bone. The first case was discharged with a granulating wound, and whilst at home lived in the same room as his phthisical sister. Six months later he returned with three unhealthy sinuses, the granulations of which showed giant cells and a few undoubted tubercle bacilli. After treatment by erosion and the use of iodoform the sinuses considerably improved.

In the other case the pus from the first abscess was found to contain only micrococci; but after spontaneous fracture of the affected femur and degeneration of one of the sinuses, tubercle bacilli were found in its walls (though only in the part nearest to the skin).

Kraske points out that tubercular infection, although undoubtedly rare in wounds, must frequently occur through the surface of the skin and mucous membranes. He instances tubercular ulcers of the rectum, larynx, and tongue in cases of phthisis, and tubercular glands resulting from scrofulous eczema and

lupus. In two examples of the so-called necrogenic lupus on the hand, tubercle bacilli have been found, and the author excised cheesy axillary glands from one of his colleagues, who was convinced he owed them to infection through the finger during an operation for tubercular bone disease.

Kraske believes that such a depressing disease as osteomyelitis may predispose to the admission of tubercle germs, as is admitted in the case of measles and of whooping-cough.

In the *Revue de Chirurgie* (1885, No. 8) the result of an examination into the nature of hygromas containing "melon-seed bodies" is recorded by MM. NICAISE, POULET, and VAILLARD. It confirms the view that they are tubercular, the bacilli being readily found in their walls. The four cases investigated included one cyst which had formed in the region of the tensor fasciæ femoris after a wound, the other three being seated in the fingers. The authors hold that the curious contents are due not to fibrin coagulation, but to a sort of necrosis of the lining membrane.

DR. MENDELSON (*Zeitschrift für klin. Med.*, 1885, p. 108) mentions eight cases in which phthisis rapidly developed after a severe contusion of the chest. He believes that some injured part of the lung formed a nidus for the bacilli to develop in, especially since the pain caused the patients to keep the affected part at rest. There was no evidence of hereditary tendency to phthisis in seven of the eight cases. Mendelsohn suggests that patients suffering from this injury should be carefully guarded from exposure to a bacillus-bearing atmosphere.

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#### OPERATIONS ON THE CLAVICLE.

PROFESSOR KRÖNLEIN (*Inaug. Diss.*, Zurich, 1885) has added one more to the list of about twenty cases of total extirpation of the clavicle for tumor. His patient was a girl aged seventeen, and the growth, in about two months, had reached the size of a man's fist. During the operation the pleura was wounded, and secured with catgut. In three weeks the wound had healed and the patient recovered good use of the arm, but unfortunately suffered a return of the disease within five months.

KRÖNLEIN has also resected a large mass of callus from a case of fractured clavicle, the limb being quite crippled owing to its pressure on the vessels and brachial plexus. No improvement in function followed the operation at the end of a year.

MR. WHEELER, of Dublin (*Trans. Acad. Med.*, 1885, p. 172), records a more favorable issue to a similar operation performed by him in 1874 on a man aged forty-three. When seen ten years later, the patient was well, able to work, and the loss of the bone could hardly be detected so far as power of the arm was concerned. Unfortunately, no account of the nature of the primary tumor is given.

MR. BARKER (*Lancet*, January 30, 1886) resected the false joint remaining after a fracture of the clavicle (sustained in utero?) on a boy aged twelve, who presented symptoms resembling somewhat those of "writers' cramp." The fragments were wired together, the wound healed at once under antiseptics, perfect immobility of the arm ensued, and the symptoms entirely disappeared.



## THE TREATMENT OF STERNO-CLAVICULAR DISLOCATIONS.

M. LE FORT (*Gaz. des Hôpitaux*, 1885, No. 47) deals in this paper with two cases of dislocation forward of the sternal end of the clavicle. He points out that in this luxation the end of the bone can be replaced very readily by direct pressure, but that it is only with considerable difficulty that it can be retained in position. With reference to this point, it may be said that M. Le Fort appears to exaggerate the evils that attend non-reduction. It is well known that the function of the upper limb may be perfectly recovered after an unreduced dislocation of the clavicle forward. M. Le Fort, after pointing out the defects in the methods usually adopted in France for the treatment of this injury, advocates the following apparatus: The clavicle having been replaced, a large sheet of gutta-percha is taken, and, while warm, is carefully moulded over the two sterno-clavicular joints, over the inner two-thirds of the clavicle on the injured side, over the lower half of the neck and the upper half of the thorax. This splint is then fixed in position by a starch bandage, and the apparatus is not removed until the end of five weeks. In the two cases cited the treatment answered admirably, and the displaced bone was perfectly retained.

## CONGENITAL DISLOCATION OF THE HIP-JOINT.

MR. WILLIAM ADAMS (*British Med. Journ.*, Nov. 7, 1885, p. 859) gives the following details of 60 examples of this deformity that have come under his notice:

Out of the 60 cases, 13 occurred in males and 47 in females. In 19 cases both hip-joints were affected, and in 41 only one hip-joint; and of these, the right joint was affected in 15 cases and the left in 26 cases. The labor, whether natural or otherwise, is noted in 45 cases, in 23 of which the labor is said to have been easy and natural, and in these cases we may fairly assume that the head presentation occurred. Breech presentation occurred in 7 cases, and prolonged labor in 22 cases. The malformation is not more often met with in first children than in other than the first born. In one instance the patient was the eighth child. Hereditary predisposition is stated to have existed in only one instance, and in that case, a girl aged six and a half years, the father and the father's sister are both said to have had congenital dislocation of one hip-joint. With regard to age, nearly all the cases have been between the ages of two and six years when they came under notice. "With regard to the general history and symptoms of this affection, it is well known that there are no symptoms whatever to direct the attention of the accoucheur to the condition of the hip-joint at the period of birth; no malposition of the limb, or immobility; on the contrary, the movements are free in all directions. As a rule, no attention is drawn to the hip-joint until after the period of walking, which is sometimes a little later than in other children, especially when both hip-joints are affected; then, if one hip-joint be affected, the child walks with a limp, and a suspicion of hip-joint disease is naturally raised, and in several instances I have known these cases treated for hip-joint disease. When both hips are affected the child walks with an awkward waddling gait, which, it is thought, it will grow out of; but as these conditions do not disappear, other opinions are taken." At about three years



of age the diagnosis becomes easy, and as age advances—say from ten to twenty—all the diagnostic symptoms become exaggerated.

Mr. Adams points out that, in the specimens so far examined, the acetabulum is either completely absent or represented by an exceedingly imperfect socket. Great alterations are observed in the size, shape, and attachments of the capsular ligament. The head of the femur is wasted, flattened, and irregular in shape, but still covered with some articular cartilage.

Mr. Adams opposes the theory that the deformity is due to spasmodic muscular action *in utero*, and maintains that the pathology is in no way identical with that of clubfoot. He also strongly opposes the view that the deformity is due to a dislocation of traumatic origin, resulting from violence inflicted during labor. Indeed, he is of opinion that the condition is not a dislocation at all, in the true sense, but that it is a displacement of the head of the femur resulting from malformation of the acetabulum. It is no question of the femur having slipped from the acetabular socket, since the evidence points to the probability that such socket never existed.

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#### THE WIRE SUTURE IN CASES OF FRACTURED PATELLA.

If this operation has been widely adopted, operators have not lately contributed much to its statistics. MR. HARDIE, of Manchester (*Brit. Med. Journal*, November 28, 1885), obtained good results in each of four recent fractures of the patella treated by suture with Listerian precautions, the patients being able to flex the affected bones to an acute angle at the end of four months. He advocated it as a routine method of treatment—a rather premature suggestion in the light of such (by no means infrequent) disasters as have been recorded. In M. Chauvel's report to the Société de Chirurgie (November, 1883), 49 cases were mentioned, with 35 successes, 3 deaths, 1 secondary amputation, and 10 failures. This formidable list is increased by a case of M. LE BEC's (*Gaz. des Hôpitaux*, January 14, 1886). This surgeon was led to operate on a man, aged forty-nine, whose left leg was helpless owing to a fracture of the patella sustained eight weeks before. It was thought that the joint was not opened, owing to a new membrane which had formed below and between the fragments. Antiseptics (sublimated solution and iodoform) were freely used, but suppuration followed around and in the joint, the two silver sutures gave way, in moving the limb the patient made the transverse wound gape widely, and he died from exhaustion a month after the operation. No full autopsy was allowed, but there were no marked evidences of pyæmia. A similar disastrous result (free suppuration and death of the patient) followed in a case reported in the *Lancet* of December 12, 1885.

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#### CARIES OF THE CERVICAL SPINE.

MR. EDMUND OWEN (*British Medical Journal*, Oct. 31, 1885) has furnished an important practical paper upon this subject. It is founded upon several cases that are selected as serving to illustrate the principal features in the clinical aspects of the disease. The following is an abstract of Mr. Owen's observations:

Disease of the high cervical spine urgently demands early diagnosis and

prompt treatment, but unfortunately the first symptoms of the mischief are not unequivocal, and are apt to be interpreted as of "rheumatic" origin.

There may be pains, possibly called "headache," over the area of the greater and lesser occipital nerves, both of which come from the second cervical nerve; or in that of the great auricular from the second and third; the third nerve joins in the formation of the transverse superficial cervical nerve, which supplies the skin over the front of the neck. The pains will be worse after play or exercise, and the child will not bear pressure on the top of, nor will it shake or turn the head. Young children are not clever at describing symptoms, and a headache "somewhere here" is apt to be the result of irritation of high cervical nerves. If the disease be lower in the neck, pain may be referred to the pectoral or deltoid regions, where the supraclavicular branches are distributed.

If the lowest cervical vertebræ be inflamed, the nerve-trunks which enter into the brachial plexus will be liable to compression, pain being referred to the shoulders, elbows, or even to the fingers. For pains in each shoulder or each arm, the cervical spine should straightway be examined. And even if obscure pains be not symmetrical, but confined to one side, attention should be directed to the spine.

Mr. Owen has made an extensive trial of Sayre's jury-mast, but has been compelled to discard its use entirely. In its place he employs a leather collar and cuirass. The apparatus is made by moulding the leather after immersion in hot water. The cuirass is composed of a breastplate and a back piece, and serves to give a secure basis to the collar. The collar is so arranged that both the chin and the occiput are steadily supported, and the cervical spine is thus kept erect and in a fixed position.

MR. W. J. WALSHAM (*British Medical Journal*, Oct. 31, 1885) proposes and has employed a somewhat similar appliance for caries of the upper dorsal and lower cervical regions of the spine. The apparatus, which is made out of one piece of felt, consists of an ordinary poroplastic felt jacket, together with an accurately fitting collar and helmet-piece. The jacket and collar are continuous posteriorly; the collar portion is carried upward over the occiput, and after encircling the neck is bent downward over the shoulders and upper part of the front of the chest, where it overlaps the jacket portion, and is there secured in position by straps and buckles. The head is kept in position within the helmet-piece by means of a strap that passes round the forehead.

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#### CAUSES OF FAILURE IN EXCISION OF THE HIP.

MR. COWELL (*Westminster Hospital Reports*, 1885) strongly advocates excision in severe cases of hip disease. The disease must be in the last stage, there must be grating between the bones, and the articulation must be quite disorganized. It is particularly indicated in cases attended by profuse suppuration, and by failing health. He has performed the operation in sixty-five cases. He discusses the causes of possible failure under the following heads:

1. Undue postponement of the operation is serious, especially if the patient is beginning to exhibit evidences of visceral tuberculosis.

2. The younger the patient the more successful the operation. The operation should never be performed in patients over fourteen or sixteen years of

age. The best results are obtained in patients between the ages of three and six.

3. The diseased tissues—to insure success—must be *entirely* removed.

4. Failure often depends upon imperfect drainage of the wound, with subsequent burrowing of pus.

5. Failure may attend a neglect of the position of the limb after operation, and especially the too early discontinuance of extension.

6. The surroundings of the patient must be healthy.

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#### THROMBOSIS.

EBERTH and SCHIMMELBUSCH have published an important monograph upon this subject (*Fortschritte der Med.*, Bd. iii., 1885, No. 12). Their conclusions are founded upon a series of experiments made upon the mesenteric vessels of warm-blooded animals. They first of all describe the normal blood stream. There is the central or axial current in the middle of the vessel where the stream is the most rapid, and where red disks alone (or practically alone) are found, and there is the peripheral current where the stream is slow and where the leucocytes congregate, and are to be seen rolling slowly along by the vessel wall. As the stream in the vessel is rendered slower, the leucocytes collect in the peripheral current and appear more numerous. When the blood stream is rendered very slow, the red corpuscles are found in increasing numbers in the peripheral part of the current, while the leucocytes are diminishing apparently by emigration. One degree further, and the whole mass of the blood in the vessel stagnates.

The authors, in the next place, oppose the usual theory of thrombosis. They maintain that it is not to be produced by a lesion of the vessel alone, nor by contact of the blood with an intima that is in abnormal condition. These circumstances are factors in the production of thrombosis, but they alone are not sufficient. They maintain, moreover, that the process is not one of coagulation, and that the blood does not coagulate in the vessel as it coagulates when it has escaped from the body.

The process is as follows: Two conditions must exist—a disturbance of the circulation, and an abnormal state of the intima. Neither of these factors is by itself sufficient. They must coexist. The blood current in the vessel is slowed; the axial current ceases to be evident; the red corpuscles enter the peripheral stream and come in contact with the vessel wall; they here undergo a change that is termed "*viscöse*." From this change it results that they not only adhere together, but they also adhere to the tunica intima. Thus the thrombus is produced.

There is in the first stage, at least, no formation or production of fibrin. The authors support their conclusions by clinical and anatomical facts relating to thrombosis, and especially point out that it is most often met with in vessels in which the stream is slow.

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#### MYCOSIS FUNGOIDES.

RINDFLEISCH (*Deutsche med. Wochenschrift*, 1885, No. 15) gives an elaborate account of the anatomy of this remarkable disease. In a typical case he had an opportunity of examining not only the nodules in the skin, but also the viscera and some secondary deposits in the lungs.



This little known disease has been described by Kaposi under the name of sarcomatosis generalis, by Vidal and others as lymphadéme cutanée, and by Auspitz as granuloma fungoides. Its main feature is the appearance of numerous successive nodules on the skin. These nodules are spongy, and after a certain period of growth break down. After a period of months or years fever sets in, and the patient dies of exhaustion.

Rindfleisch found this disease to be distinctly a dermatomycosis. He found in the capillaries about the nodule plugs, which, on further examination, proved to be colonies of a minute streptococcus. To this bacterium the disease is evidently due. Like colonies were found in the secondary deposits in the lungs. The name given to this remarkable malady by Rindfleisch would appear, therefore, to be the most appropriate of the many with which it is burdened.

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#### A CASE OF CHYLOTHORAX DUE TO RUPTURE OF THE THORACIC DUCT.

This very interesting and remarkable case is reported by DR. KRABEL, in *Centralblatt für Chirurgie*, Oct. 17, 1885. The patient, a lad aged sixteen, was admitted into hospital on August 31st. He was engaged in a mine, and while pushing a train of trucks along the rails toward the shaft, he was met by another train coming in the opposite direction, and upon another line of rails. He was in the space between the two lines, and this space was too narrow to allow a man to stand when both of the lines were occupied by trucks. He was struck upon the left side by the advancing wagon, and thrown upon his back, across the rails. While in this position, one of the empty trucks that he had been pushing passed across his chest from left to right. On admission, he did not seem to be severely hurt. No fractures could be detected, nor was there much bruising. He complained of some tenderness over his back, but he retained perfect power in all his limbs. There was neither emphysema, nor cough, nor hæmoptysis, nor dyspnœa. Pain was felt over the chest. An examination of the left side of the thorax revealed a perfectly normal condition, but there was some dulness over the lower part of the right pleural cavity, and here the breath-sounds were lost. The case was diagnosed to be one of hæmothorax. The lad did well for three days. There was no fever, no dyspnœa, no symptom to cause alarm. The dulness, however, on the right side increased. On the fourth day, he began to suffer from dyspnœa, and lay upon his right side. On the fifth day, he complained of terrible oppression in the chest and great difficulty in breathing. The whole of the right side was now quite dull, and over this area no breath-sounds could be heard. He became cyanosed, and collapsed, and died on the same day with all the phenomena of apnœa. At the post-mortem the liver was found much pressed down into the abdomen. The right pleural cavity contained a gallon and a half of a whitish, milky, odorless fluid, which proved to be pure chyle. There was no admixture of either pus or blood. No pleurisy existed, except quite at the lower part of the cavity. The right lung was quite collapsed, but uninjured. All the other viscera were sound. The body of the ninth dorsal vertebra was found broken right across. There was no displacement, and the fracture looked more like a saw-cut. The meninges and cord were perfectly sound. It was just above the line of the fracture that the thoracic duct was found to be entirely torn across.



## TREATMENT OF EMPYEMA.

MR. R. J. GODLEE (*Lancet*, January, 1886) reviews the whole subject in two interesting lectures. He points out how much the age of the patient influences the prognosis, children both recovering from the various operations and disposing of residues of pus more easily than do adults, and he records several cases amongst the former in which a single aspiration effected a permanent cure. If, however, aspiration has been employed several times without success, he advocates freely opening the cavity a little below and outside the lower angle of the scapula, at the same time excising part of the eighth or ninth rib. Sometimes the pyogenic membrane is scraped away, at other times iodine solution is injected, but the occasional danger of both measures hinders their being considered always advisable. The use of iodoform or other antiseptics is strongly urged. Mr. Godlee has already performed Estlander's operation, and prefers to remove the thickened periosteum as well as the ribs, the danger of hemorrhage from the intercostal vessels being insignificant. In one case, parts measuring two inches each were removed from five ribs, with a good result.

In children, an attempt to dispense with drainage may be made much sooner than in adults, in whom the tube should be worn as long as pus continues to discharge. Patients with chronic phthisis and empyema should not be operated on unless the latter condition is causing much inconvenience; the same applies to cases in which the cavity is quietly discharging its contents through the bronchi.

DR. FISCHER, of Strassburg (*Centralbl. f. Chir.*, November 28, 1885), advises that the opening should be made in the seventh or eighth intercostal space in the line of the scapula (in this practically agreeing with Mr. Godlee), and invariably excises part of a rib at the same time. He employs injections (by preference one containing chloride of zinc) only if the pus is foul, and uses wood-wool as a dressing. Resection of several ribs is only justifiable when the patient has been allowed to get about for some time, and the cavity shows no signs of closing.

In a record of forty cases CORMACK (*Thèse de Paris*, 1885) gives ten fatal results of Estlander's operation, and the same number of complete cures. The procedure is best undertaken after an interval of from six to twelve months from the formation of the fistula. A very large cavity, extensive tuberculosis, and communication with a bronchus are contraindications.

DR. MACLAREN (*British Med. Journal*, January 23, 1886) successfully removed parts of six ribs in a boy aged eighteen, and suggests that the cartilages may also be divided in cases in which much diminution of the cavity is aimed at.

ROSE, of Berlin, has lately excised parts of eight ribs from a patient with empyema, with a successful result.

## GASTROSTOMY.

PROF. ZESAS (*Archiv für klin. Chir.*, xxxii. Heft 1, S. 188) treats at great length the statistics of this operation. He includes 162 cases, 129 of carcinoma, 31 of non-cancerous stricture of the œsophagus, and 2 of syphilitic ulceration. Before antiseptics came into use the operation was almost invariably fatal,

while since that time about one in every four cases have survived for a time. The author favors the oblique incision (parallel to the thoracic edge), and secures the peritoneal and serous coats first to the wound, subsequently suturing the mucous membrane to the skin. He deprecates dividing the operation into two stages, since by deferring the final opening of the stomach the patient may die of starvation before the wounded surfaces have adhered. Local anæsthesia is recommended to prevent vomiting.

M. COHEN (*De la Gastrostomie*, etc., Paris, 1885) discusses the operation with regard to non-cancerous stricture. He agrees with Zesas in recommending immediate opening of the stomach, although the statistics of the operation in two stages are the most favorable (seventeen recoveries out of twenty-four cases, as opposed to seven out of twenty). He attaches importance to sudden onset of severe thirst as an indication for gastrostomy in cases of stricture. A careful analysis of the cases hitherto recorded is given.

MR. KNOWSLEY THORNTON (*Lancet*, January 9, 1886) records the second successful gastrostomy for the removal of a mass of hair (the first being performed by Schönborn, see Langenbeck's *Archiv*, 1883, p. 609). His patient was a girl aged eighteen, who had for some years been addicted to swallowing hair. The passage of a fecal concretion containing hair threw light on the nature of the abdominal tumor. A median incision having been made, the great curvature was opened and a mass weighing two pounds easily removed, exposing a healthy mucous membrane. Thirty carbolized silk sutures were used for the stomach, fifteen of them passing only through the peritoneum, the closed wound measuring three inches. Antiseptics were used throughout. Next day, on account of vomiting and epigastric pain, the external wound was reopened and a missing sponge extracted. At the end of forty-eight hours the patient was allowed iced milk in small quantities, after a fortnight corn flour was added to this diet. Nutrient enemata were given every three hours during the first week.

The recovery was complicated by the formation of an abscess in the right parotid, temporary attacks of polyuria (probably hysterical), and occasional elevation of temperature; but she left the hospital at the end of four weeks, and has remained well during the two years that have since elapsed.

Mr. Thornton appends a notice of previous examples of this curious foreign body in the stomach, at the end of his valuable and detailed account of a most successful case.

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#### GASTRO-ENTEROSTOMY.

The operation was performed by DR. RYDYGIER (*Przegląd lekarski*, 1885, No. 6) in a man aged thirty-two, who was suffering from cicatricial stenosis of the pylorus. Symptoms had existed for twelve months. There was hæmatemesis, and the patient had passed bloody stools. No tumor could be detected. Laparotomy was performed on July 26. The pylorus was found firmly fixed by adhesions to the liver and gall-bladder. As resection could not be carried out, openings were made in the stomach and in a loop of the upper intestine, and a permanent fistula established between these two parts by means of careful suturing. The operation was first devised and carried out with success by Wölfler in a case of carcinoma. The patient did well, and left the hospital in thirty-seven days.

## HERNIA.

MR. R. J. GODLEE (*Med. Times and Gazette*, Oct. 3, 1885) reports two cases of successful herniotomy in infants (five and six weeks old): He has seen two other cases of strangulated inguinal hernia at about this age; in all, the testicle was swollen, and subsequently became inflamed. Although possibly the intestine might have been reduced by further efforts at taxis in one or more of the cases, he advocates operating in order to suture the external ring.

DR. WIESMANN (*Korrespondenzblatt für schweizer Aerzte*, No. 17, 1885) records an instance of properitoneal hernia in the inguinal region of a man aged seventy. He had kept the rupture up thirty years with a truss, and had suffered from strangulation symptoms for two days. Taxis failing, a small sac was opened and its contents found to be a much congested Meckel's diverticulum. It was further discovered that the sac led into a large one between the abdominal wall and the peritoneum. This was also opened, and a fibrous ring divided. Whether a second strangulation existed or not, was not certain. Peritonitis had already set in, and the patient died three days later.

From the description, it seems most likely that the case was one of reduction *en masse*.

MR. SPANTON (*Lancet*, Jan. 2, 1886) removed a hard fibrous tumor from the right spermatic cord of a boy aged fifteen, it having produced the symptoms of a strangulated omental hernia. Inflammation and even sloughing of the scrotum had been produced by its pressure, and the testis was excised at the same time. The wound rapidly healed. The tumor, which was the size of a large pigeon's egg, had been reducible.

MR. A. E. BARKER (*Brit. Med. Journal*, Dec. 12, 1885) has performed the operation for radical cure of umbilical hernia on two cases, both women between forty and fifty. Carbolic gauze dressings and the spray were used in each, the omentum being excised, and the ring closed by silk sutures, the sac and redundant skin having been cut away. Both operations were not incidents in that for strangulated hernia, but were performed with the direct object of a radical cure. Such cure, up to the last report (seven and three months afterward), appeared to have been obtained. An attack of pneumonia complicated the recovery in the second case.

## INTUSSUSCEPTION.

DR. V. BASCH (*Wiener Med. Blätter*, 1885, No. 7) holds, from experiments on the rectum, that the intestinal wall (the longitudinal muscular fibres) can, under certain circumstances, actively dilate the bowel, and thus produce an aspiratory effect. Owing to the pressure within that part being thus lowered, the mucous membrane above may be drawn down, and thus produce intussusception.

It is well known that intestinal polypi are sometimes the cause of this lesion, and in dissecting a fatal case, Prof. Heller, of Kiel, discovered that an inverted diverticulum had acted in the same way.

## THE OPERATIVE TREATMENT OF CANCER OF THE RECTUM.

DR. VOIGT has published an elaborate paper upon this subject (*Inaug. Diss.*, Halle, 1885). His report deals with eighteen cases of excision of the rectum



performed by Prof. Genzmer, according to Bardenheuer's method. Of this number, one patient died of shock, two of septicæmia, one of exhaustion at the end of three months, one at the end of sixteen days from embolism, after apparent recovery, and one at the end of four months, of the effects of urinary infiltration, the urethra having been removed in part with the rectum. In all the remaining patients a good immediate recovery followed, and in no instance has there been, so far, any local recurrence of the disease. The great majority of the operations, however, have been but recently performed. The last recent operations date from three years (two cases), two years, and one and a quarter years before the publication of the monograph.

Two patients died at the end, respectively, of seven and ten months of secondary deposits in the liver.

In eight of the cases the peritoneum was opened, and in two instances the vagina, and in one instance the urethra was removed in part with the new growth.

The author speaks in enthusiastic terms of the operation, and goes so far as to advise its adoption as a palliative measure, even in cases in which the glands have become involved, and the tissues about the bowel have become infected. He enters into elaborate detail concerning the steps of the operation. He advises that the coccyx should always be left when possible. It supports the parts, and greatly assists proper drainage. All the room that is needed in most cases can be obtained by continuing the incision backward to the sacrum on either side of the coccyx. In cases of high disease the sound segment of rectum between the growth and the anus should be removed. Dr. Voigt holds that there is no objection to the opening of the peritoneum. Indeed, he points out that the more of the rectum that is cut away, the wider is the segment of the meso-rectum that is reached, and the easier can the gut be drawn down and fixed to the skin. He states that from three to five inches of the bowel can be cut away without opening the peritoneum. He makes use of free drainage and frequent irrigation with solutions of chloride of zinc or corrosive sublimate.

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#### RESECTION OF PORTIONS OF THE BLADDER.

Some months ago DR. ZNAMENSKY published in *Archiv für klin. Chirurgie*, Bd. xxxi. Heft 1, an interesting account of a series of experiments upon animals, in which portions of the bladder were removed. He operated upon dogs and removed considerable portions of the bladder-wall, with results that may be called successful. The wound left by the resection was carefully closed by means of sutures applied in a double row. All the operations were suprapubic, and concerned the summit and anterior wall of the viscus. No attempts were made upon the fundus of the bladder.

DR. ANTAL has gone a step further, and in *Centralb. für Chirurgie*, Sept. 5, 1885, publishes an account of a case in which a part of the bladder of a man, aged sixty-one, was removed for epithelioma. The patient made a good recovery. The author commences his paper by referring to nine cases in which vesical tumors were removed by a suprapubic operation, but it would appear that in none of these instances was any part of the bladder wall excised. The only published case of resection of any part of the bladder previous to Antal's case, is placed to the credit of Sonnenburg. This surgeon removed



the upper two-thirds of the bladder, together with the peritoneum over it, and then closed the entire wound. The patient died in six weeks of exhaustion. Antal's operation was extraperitoneal. The patient had presented symptoms of vesical tumor for two years, and had suffered from hæmaturia for one year. He was much emaciated. The tumor was diagnosed at the vertex of the bladder. The viscus was movable, and no enlarged glands could be detected. The operation was performed on April 23, 1885. After the bladder had been well washed out with an antiseptic solution, the abdominal wall was incised above the pubes, and the space between the peritoneum and the symphysis opened up. The peritoneum was then carefully stripped from the bladder. An incision was now made into the viscus, and on introducing the finger a tumor the size of a child's fist was detected. The tumor, together with the part of the bladder from which it grew, was then removed. This involved the excision of about one-third of the entire organ. Seven vessels required ligature. The vesical wound was closed. A drain was introduced and allowed to project from the abdominal wound. The suprapubic fistula closed on June 17th, and the patient made a good and speedy recovery. He is able to hold his water for three or four hours.

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#### SUPRAPUBIC LITHOTOMY.

SIR H. THOMPSON (*Lancet*, Dec. 5, 1885), during the last two years, has performed this operation seven times, with one death (a feeble patient aged seventy, the stone weighing only one and three-quarters ounces), and has also removed a large fibro-papilloma by the same method. He invariably first raises the bladder by distending the rectum (using the India-rubber bag introduced by Garson, of London, and Petersen, of Kiel). The bladder is also partly filled with some eight ounces of an antiseptic fluid. The knife is only required for division of the skin, linea alba, transversalis fascia, and the vesical wall; the other structures are traversed with the aid of the finger-nail or a special ivory instrument in its place. No deep sutures are used, and only one vessel required a ligature in all the eight operations.

The results are so brilliant that the suprapubic operation will probably receive an impetus from this publication. Sir H. Thompson advocates its use for all hard stones weighing two ounces and upward. He has lately published a short monograph on the operation.

On the Continent many cases have lately been recorded. DR. ORLOWSKI (*Centralbl.*, 1885, No. 51) successfully operated on three patients, aged respectively seventy, eighty-three, and sixty-four years. In one case he removed a bougie from the bladder, in another a large calculus from behind the prostate, and in the third several stones which had formed subsequent to a lithotripsy done one and a half years before. He advocates suturing the outer coats of the bladder-wall as diminishing the risk of urine infiltration and hastening the recovery, whilst admitting that immediate union cannot be thus secured. It should be said that one of his cases succumbed to pneumonia three weeks after the operation, but the wound had remained healthy.

A discussion at the Society of German Surgeons took place in Strassburg, September, 1885 (*Centralbl.*, No. 48, p. 849), in which KRASKE reported a successful removal of a large phosphatic calculus by the suprapubic method, and Lücke a similar case, in which he was obliged to break up the stone with

chisel and mallet, the patient recovering. Prof. Czerny, of Heidelberg, had also performed the operation with good results; he did not employ distention of the rectum, since it added to the difficulty after the bladder was once opened, but advised deep sutures, unless the vesical wall had been bruised during the extraction.

In the latter opinion there seems to be a general concurrence amongst foreign surgeons.

DR. MORISON, of Newcastle (*Lancet*, January 9, 1886), removed a stone weighing nearly twenty-three ounces, from above the pubes, a pair of mid-wifery forceps being used to extract it. The patient died suddenly on the fourteenth day.

MR. RIVINGTON, at the London Hospital, lately succeeded in removing one even more heavy (twenty-four ounces) from an elderly man, employing the chisel, as in Lücke's case. The patient did fairly for a time, but sank after an interval of several weeks. The case was of particular interest in two respects: the kidneys were found to be practically healthy, and no correct diagnosis could be made until the bladder was opened.

PROF. ANNANDALE (*Brit. Med. Journal*, January 2, 1886) proposes to extend the use of suprapubic lithotomy to cases of small vesical calculus in boys. Having detected the presence of a small stone in a patient aged four and a half years, he dilated the urethra sufficiently to allow the lithotrite to be passed, then injected four ounces of an antiseptic solution, seized the calculus between the blades of the lithotrite, and made the later press against the vesical wall immediately above the pubes. A very small incision enabled him to extract the stone and to introduce an India-rubber catheter, which was then drawn by the lithotrite along the urethra. Sutures were only used for the superficial structures, urine ceased to flow from the wound after two or three days had elapsed, and the boy was up and well on the tenth day.

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#### RUPTURE OF BLADDER.

DR. GARRÉ (*Korrespondenzblatt für Schweizer Aerzte*, 1885, No. 14) reports an interesting case of this accident. A man, aged twenty, presented urgent symptoms of retention of urine, three hours after a fall of thirty feet in which he struck his abdomen. On catheterization, several ounces of bloody urine were drawn off. In the absence of tenderness or pain in the renal and urethral regions, a diagnosis of rupture of the bladder was made. After distending the rectum, the usual suprapubic incision was made. The peritoneum was found to be uninjured, but the anterior vesical wall had been torn for a length of one inch; the edges of this rupture were stitched to those of the operation wound, and free drainage was provided for. The fistula closed at the end of five weeks, the patient making a good recovery in spite of coincident fracture of one radius and the complication of orchitis and epididymitis. The author holds that in rupture of the posterior wall hardly any urine can be withdrawn by the catheter, but exceptions to this statement have been met with owing to the tear being only subperitoneal.

He gives as the chief reason why this accident has happened so often during intoxication, that the abdominal muscles have by its influence lost to a great extent their elasticity and protective power.

DR. VARNIER (*Progrès Méd.*, 1885, No. 12) gives another instance of rupture apparently from excessive distention. A man, aged thirty-five, after a drunken debauch, was seized some twenty-four hours later with an excessive but powerless desire to empty his bladder; on the following day a considerable amount of urine tinged with blood was drawn off. Seven litres of urine mixed with blood and pus were subsequently removed, but the patient died of peritonitis within a few days after the first symptoms. The bladder was found to be empty, with a small rupture on its posterior wall near to the summit, its borders being irregular and ecchymosed. No trace of disease was found in the rest of the genito-urinary organs; the apices of the lungs showed slight tubercular changes. Varnier dismisses the idea of traumatism either from within or without the bladder, and holds that the excessive distention alone caused the rupture; nor is there wanting good evidence in favor of this explanation, derived both from lithotomists and from post-mortem experiment. The writer refers to a similar case given by MacEwen (*Lancet*, Sept. 27, 1883).

#### OPERATIVE TREATMENT OF ENLARGED PROSTATE.

MR. REGINALD HARRISON (*Lancet*, January 16, 1886) briefly alludes to the good results obtained in twenty cases on which he has performed partial prostatectomy, incision of the obstructing portion, or perineal drainage.

Two cases only proved fatal, and in them extensive disease of the kidneys, etc., was found; a third (excision of a malignant growth) died after ten months of comparative comfort. One result of perineal drainage with retention of a tube (which can be closed by a stopcock so as to allow the patient to get about) is to enlarge the aperture into the bladder, and this may subsequently enable the patient to dispense with the use of instruments. The author asserts that even atrophy of the whole organ may follow the pressure of the canula. In urging the advantage derived from the operation he agrees with Professor Braun (*Centralbl.*, November 14, 1885), who performed external urethrotomy on a patient aged sixty, in whom catheterization had only produced false passages. The canula (which should be just large enough to fill the prostatic urethra) was withdrawn after sixteen days; the perineal wound rapidly closed, and the patient was able during the remaining year of his life to micturate with greater ease than before the operation.

He alludes to a similar case of Professor Czerny's, where the same procedure proved fatal, but holds that it should not be regarded as a test of the operation, since the patient was already reduced by nephritis, etc. Unfortunately this complication must be feared in a fair number of cases for the relief of which it is performed. Professor Braun holds that repeated suprapubic aspiration is both painful and inconvenient, and is deterred from leaving a canula in this position by having seen one case prove fatal from subperitoneal infiltration with decomposing urine.

One advantage which he claims for external urethrotomy in enlarged prostate is that the difficulty of detecting and dealing with calculi formed behind it is thus diminished.

#### EXTRACTION OF FOREIGN BODIES.

SIR W. MACCORMAC (*Lancet*, January 2, 1886) narrates the successful removal of the blade of a tooth-forceps from the right bronchus. The foreign



body, which measured one inch, could be diagnosed to have become impacted at the site mentioned, and emetics with inversion having failed, a free tracheotomy was done after division of the thyroid isthmus. After many attempts the blade was grasped by forceps and withdrawn. The patient speedily recovered.

DR. MACGILLIVRAY (*Lancet*, December 12, 1885) succeeded in removing an Enfield bullet which had remained embedded for many years in the internal condyle of the femur, with considerable improvement to the patient's use of the limb.

M. VERGELY (*Journal de Méd. de Bordeaux*, 1885, No. 46) records the case of a man aged eighty-two, who was admitted for a phlegmonous abscess in the right groin, from which was removed a penholder nearly eight inches long, which the patient admitted having introduced per rectum two months previously. It is probable that the great mobility of the sigmoid flexure accounted for the position of the abscess.

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## IN AMERICA.

### UNDER THE CHARGE OF

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### RUPTURE OF THE LIGAMENTUM PATELLÆ, AND ITS TREATMENT BY OPERATION.

DR. HENRY B. SANDS (*The Medical News*, Dec. 26, 1885), taking as a text two cases which had come under his own care, has given, with the clearness and thoroughness that characterize his work, a valuable account of the frequency, causes, results, and treatment of rupture of the ligamentum patellæ. To the 65 cases collected by Maydl he adds 13 treated in four New York hospitals. The infrequency of the injury, compared with that of fracture of the patella, is shown by taking the number of cases (553) of the last-named injury treated in the same hospitals, the proportion being about 1 to 25.

The cause appears commonly to be a powerful contraction of the quadriceps, in an attempt to avoid a fall, but it has also been caused by violent flexion of the (normal) knee, and by forced flexion practised with the object of overcoming ankylosis. In 3 of the cases collected by Dr. Sands, the rupture occurred in persons who had previously suffered from transverse fracture of the patella on the same side, after intervals varying from eight months to ten years, and after ligamentous union of the fracture, the uniting band being two inches long in two of them. From these, and from other examples of the same singular sequence which he found recorded, he draws two conclusions: 1st. That fracture of the patella may establish a predisposition to rupture of the ligamentum patellæ, either by partial ossification of the ligament, as observed in one case, or by so weakening the limb as to render the individual less able to avoid determining accidents. [Possibly in some of these cases the cause was extensive flexion of the knee, the descent of the patella being limited by adhesions.—REP.] The second inference is, that the fibrous band



of union between the fragments of a broken patella may be able to bear a greater strain than the normal patellar ligament, even when this band is of considerable length.

In 7 of his 13 cases, the seat of rupture is definitely stated: in 3 it was at the upper, and in 4 at or near the lower attachment of the ligament, and in 2 cases a small piece of the patella was torn off.

The treatment adopted in most of the reported recent cases was essentially that of fracture of the patella: elevation of the limb with the knee fully extended, cold applications to the joint, and the use of pads, straps, and bandages for the purpose of approximating the ends of the ruptured ligament; and, as a rule, such treatment was followed by a fair amount of recovery of the functions of the injured limb. Exceptionally, the reunited ligament was no longer than its fellow, but usually it was more or less lengthened, sometimes to the extent of several inches; and, as a rule, the impairment of the power of active extension bore a direct ratio to the amount of this lengthening.

In Dr. Sands's second case, the injury was of eight months' standing, and his operation—freshening and reunion of the separated ends—appears to be unique. The incision was longitudinal, nine inches long, and in the median line. Before the upper end could be brought into contact with the lower one, many deep oblique and transverse incisions had to be made in the median and lateral portions of the quadriceps; the ends were fastened together with two sutures of stout silver wire, cut short. The joint, which was freely opened during the operation, was drained with two bone drains. The patient at first suffered constant pain, which, however, ceased after the fourth day; the wound healed without suppuration; the patient wore a protection splint during the third and fourth months, and the limb had then become very useful and was gaining in strength and freedom of motion. Apparently the sutures had cut through the ligament and union had taken place by an interposed fibrous band.

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#### CONSECUTIVE DOUBLE NEPHROTOMY, ON ONE SIDE FOR PYONEPHROSIS, ON THE OTHER FOR ACUTE OBSTRUCTION OF THE URETER.

At the meeting of the New York Surgical Society of December 22, 1885, DR. F. LANGE reported (*The Medical News*, Jan. 16, 1886) an interesting case in which he had performed nephrotomy, first upon the left side, and then, after an interval of nearly nine weeks, upon the right side.

The patient was a man, thirty-two years of age, who had suffered from urinary trouble, and had had pus in his urine since he was twelve years old. During the preceding three or four weeks the amount of pus, the pain, and the frequency of urination had greatly increased. The pain was felt only in the left side and in the penis; the urine contained much pus, but no blood and no casts. A firm round tumor, as large as the head of a child at term, could be felt in the region of the left kidney; the right kidney appeared to be somewhat dislocated downward, but was not enlarged.

The left kidney was exposed by a longitudinal lumbar incision, and when the pyonephrotic sac was opened, it was found to contain a great number of irregular calculi embedded so deeply in the recesses of the calices that their

removal was prolonged and laborious, and was effected only after some laceration of the tissues, and by the breaking down of interposed partition walls. The wound was drained, and frequently irrigated with a warm borosalicylic solution. The amount of pus in the urine diminished but did not entirely disappear, the tumor became much smaller, the discharge from the fistula was moderate and contained very little urine, and the patient was discharged greatly improved at the end of six weeks.

On the 25th of November the patient began to complain of pain in the abdomen; there was obstinate constipation, and the urine was very scanty. When next seen by Dr. Lange, November 29th, the abdomen was tympanitic and painful, and the principal pain was felt in the right side. There was dyspnœa, a weak pulse, and no urine in the bladder. The diagnosis of occlusion of the right ureter was made. After preliminary exploration of the fistula on the left side, because of the possibility that an inflammatory process originating there might have spread to the right side and have caused the occlusion, and after removal of a considerable number of calculi found in it, the right kidney was exposed by a lumbar incision. The connective tissue under the quadratus lumborum was found infiltrated with a watery liquid, looking like urinary infiltration; the fat was removed from the posterior aspect of the kidney, and in the substance of the latter, near the insertion of the pelvis, was found an abscess, which seemed about to perforate. After opening the abscess, the finger was passed without resistance into the pelvis of the kidney, and on withdrawing it a great quantity of bloody urine escaped. Exploration of the dilated ureter, with a pair of long, slender dressing-forceps, revealed an obstruction which did not give the feeling of a stone. By injecting warm water, this obstruction was promptly washed out; it proved to be a whitish-gray plug, about the size of the terminal phalanx of the little finger, somewhat flattened and crucial, resistant but brittle, and apparently consisting of an old fibrinous clot, in which numerous gravel-like concretions were embedded. A medium sized bougie could then be passed through the ureter to the bladder. Hemorrhage was free, but was easily checked by plugging with iodoform gauze about a drainage tube.

The patient made a rapid recovery, and at the time of the report there remained on the right side only a superficial, healthy-looking, granulating wound. The stones removed, about fifty in number, had a total weight of 23 grammes.

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#### RESECTION OF THE LARGE INTESTINE FOR CARCINOMA.

This operation, the only successful one of its kind in this country, was done October 22, 1885, at the New York Hospital, by DR. ROBERT F. WEIR (*The Medical News*, Feb. 13, 1886). The patient, a man fifty-four years of age, had been suffering for the preceding two years with painful and frequent bloody stools, with occasional prolapse of the rectum occasioned by the tenesmus. Bimanual examination under ether disclosed an irregularly elongated mass, the lower surface of which could be obscurely felt by the finger in the rectum, situated near the upper border of the pelvis, and movable from side to side.

The abdomen was opened under the carbolic spray by an incision four inches long below the umbilicus, and the tumor drawn out through the wound.

It was a knobbed mass, four inches long, and its upper edge reached nearly to the sigmoid flexure. Temporary ligatures were placed about the gut above and below the tumor, the mesorectum corresponding to the tumor secured by a row of silk ligatures placed parallel to, and as far as possible from, the bowel, and the included intestine, five and a half inches in length, excised. Two small but enlarged glands were subsequently found in the stump of the mesorectum, and removed. Because of the practical difficulties attending an attempt to reunite the ends of the divided intestine, it was determined to establish an artificial anus in the abdominal wound. The upper end of the lower segment of the rectum was closed by inverting its edges and securing it with a double, and in part triple row of Czerny-Lembert sutures, and the end of the upper segment secured in the upper angle of the abdominal incision, the seat of which was closed by strong catgut sutures passed through the entire thickness of the wall, a continuous catgut suture of the peritoneum, and interrupted catgut sutures of the skin and muscle. There was much complaint of pain during the first five days, and some distention of the abdomen, to relieve which two of the deep sutures were cut. On the seventh day the bowels moved, with the aid of a cathartic, and it was found that the incision had reopened throughout its whole extent, and in the mass of feces filling it was seen a coil of small intestine. Fortunately, adhesions had formed which shut off this coil from the general peritoneal cavity, and no reaction followed this mishap; the intestine was cleaned and the wound closed; it healed by granulation in about seven weeks.

November 14, three weeks after the operation, there was a fecal discharge from the original anus, followed on the next day by the passage of considerable flatus, and on the 16th by the escape of nearly a pint of dark brown liquid, having a strongly fecal odor. No further discharge took place until the 20th, when two ounces of a thin, light brown, purulent liquid escaped through the anus. The finger introduced into the rectum could not feel its upper limit, and a rubber drainage tube passed in for a distance of six inches gave exit to three or four ounces of fetid brownish pus; the tube was left in place for ten days, and the cavity of the abscess daily washed out through it. January 2, 1886, the patient was discharged, rapidly gaining in flesh and strength.

The report is followed by the tabulation of thirty-five collected cases and the discussion of the comparative merits of various details in the technique of the operation, and of the relative safety of reunion of the divided intestine, and of the establishment of an artificial anus. Dr. Weir's conclusion that it is more prudent to establish an artificial anus than to reunite the intestine will probably be accepted by most surgeons, although the percentages of mortality furnished by the two methods do not materially differ. The causes of death are so largely independent of this detail that the question cannot be determined by the percentages of mortality in so small a number of cases. The cases must be studied, not merely counted; and the risk of leakage after reunion of the intestine is one that is not counterbalanced by any of those peculiar to the method by formation of an artificial anus.

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#### LOCAL ANÆSTHESIA BY WEAK SOLUTIONS OF COCAINE.

DR. J. L. CORNING (*New York Medical Journal*, Jan. 2, 1886) describes the extension that has been given to the use of cocaine for obtaining local anæ-



thetia, as recommended by him in September, 1885, and the details and modifications of the method of use which his subsequent experience has suggested. He recommends weak solutions—one, one-half, and even one-third per cent.—injected in fractional parts throughout the entire field of operation, in depth as well as in superficial area. When the operation is to be done upon a limb, he recommends the distal application of an Esmarch bandage, then the injection, and then an elastic tourniquet on the central side of the anæsthetic zone. If supplementary injections are required during the operation, he reapplies the Esmarch, removes the tourniquet, makes the injections, and then immediately reapplies the tourniquet. Anæsthesia has been maintained by these means for two hours at a time.

For operations upon the trunk or head, he arrests the venous flow by surrounding the field of operation with a rubber-covered wire ring pressed firmly against the skin by straps tied around the body. No unpleasant constitutional effects have been observed after the use of the drug in this manner.

The absence of clinical details from the paper suggests the propriety of some caution in accepting all that is claimed for this means of obtaining local anæsthesia, especially in view of the facts that it has not always been found entirely satisfactory by some who have employed it both before Dr. Corning did and subsequently, and that the degree of insensibility and the interpretation of its cause are still in dispute. The pain suffered by another is proverbially easy to bear, and is liable to be underestimated; and, further, it is well known that the excitability or conductivity of a nerve rapidly disappears after its blood supply has been cut off. It seems, therefore, desirable that these claims for cocaine should be subjected to careful control experimentation before it is accepted as a superior substitute for ether, and all the more because alarming constitutional disturbances occasionally follow its use.

Since the above was put in type, DR. VARICK (*N. Y. Medical Journal*, Feb. 20, 1886) has reported in detail a case in which he amputated the thigh, using cocaine in this manner after an attempt to obtain general anæsthesia by means of ether had produced alarming symptoms. The method appears to have been completely successful in preventing pain.

## OPHTHALMOLOGY.

UNDER THE CHARGE OF

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### AN ATTACK OF GLAUCOMA FOLLOWING THE INSTILLATION OF COCAINE.

MANZ reports a case of this nature occurring in a woman, aged fifty (*Bericht der 17te Versammlung der Ophth. Ges.*, 1885). The patient was presbyopic, and came to be fitted with glasses. Vision for the distance was about normal,



but the patient had complained of various photopsic manifestations, and there was a shallow anterior chamber. With the ophthalmoscope there was seen a slight cloudiness of the tissue of the disk, and a somewhat deep physiological excavation. Cocaine had been used in the right eye to dilate the pupil and render an ophthalmoscopic examination more easy. On the following day Manz was called to the patient, and was told that on the previous evening she had severe pain in the right eye, headache, and a sudden failure of vision. He found in the right eye a typical attack of acute glaucoma, great circumcorneal and conjunctival injection, chemosis, dilated and immovable pupil, cloudy media and increased tension, and severe pain. An iridectomy was immediately made, and the result was very satisfactory.

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#### THE RELATION OF CERTAIN GLAUCOMA SYMPTOMS TO THE THEORY OF INCREASED INTRAOCULAR TENSION.

PFLÜGER calls attention to the so-called "halo glaucomatosus," and the paracentral scotoma (*Bericht der 17te Versammlung der Ophthal. Ges.*, 1885). He regards the halo seen on and around the optic disk in cases of glaucoma, as an exudation, and that it is almost always accompanied by retinal oedema. In these cases there may also be found layers of exudation upon the iris, ciliary body, and between the ciliary body and the sclera. He next calls attention to certain perimetric peculiarities of the field met with in glaucoma, such as paracentral scotomata, a zonular visual field, and the changeability of the outer limits of the field in glaucoma. He thinks that paracentral scotomata occur much more frequently than has hitherto been supposed, and that this form of scotoma is not dependent upon an increased intraocular tension. The rapid loss of vision occurring in glaucoma fulminans, he thinks, cannot possibly be caused by increased tension, but is due to a serous transudation between choroid and retina. Too much influence has been ascribed to increased intraocular tension as the *direct* cause of the disturbance of function in glaucoma.

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#### THE OPERATIVE TREATMENT OF CONJUNCTIVITIS GRANULOSA.

VOSSIUS's paper contains nothing new, but is very timely (*Bericht der 17te Versammlung der Ophthal. Gessellschaft*, 1885). He endorses all of Schneller's suggestions, but his method of operating is somewhat different. He recommends the extirpation of the tarsus or retrotarsal fold alone, or of both, as far forward as a line running two millimetres from the free margin of the lid, according to the nature and severity of the case. He usually employs chloroform, and considers it in children absolutely necessary. In operating, the upper lid is everted, and the conjunctiva at the convex border of the tarsus, both at the inner and the outer canthus, seized with forceps by an assistant. The retrotarsal fold is then drawn forward, so that the rugæ are rendered smooth. While the assistant in thus keeping the conjunctiva on the stretch, he divides the diseased portion from one canthus to the other with scissors, first on the side toward the eyeball, and afterward along the upper tarsal margin. The hemorrhage is then checked by iced applications, and the divided tissue is then carefully dissected up and in part cut off, according to the severity of the case. The cul-de-sac is then carefully

washed out with boric acid solutions, a moist boric acid bandage applied, and over this an ice bladder. This bandage is changed daily for four days, all secretion being carefully washed away. Vossius continues the iced applications for fourteen days, and usually within this period the wound has healed.

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#### OBSERVATIONS ON EMPYEMA OF THE FRONTAL SINUS.

BORTHEN reports three new cases of this interesting lesion (*Archiv für Ophthalmologie*, xxxi. 4). He considers the diagnosis difficult, but the position of the swelling beneath the brow, the fluctuation which may be demonstrated by palpation, and finally the sensitiveness to pressure, all point to empyema. If a communication with the cranial cavity is feared, it should be seen whether pressure backward upon the tumor will produce any brain symptoms. If a communication exist with the nasal cavity, pressure upon the swelling will cause pus to exude from the nostril. He regards the prognosis as bad unless the treatment is begun early in the development of the disease. The development, though slow, is always progressive, and causes general absorption of bone, dislocation of the eyeball, and inflammation of the contents of the orbit. The most common cause is chronic coryza, which is propagated directly from the nasal fossæ to the frontal sinus. The swelling of the lining mucous membrane closes the communication between the cavities, the secretion collects in the frontal sinus, an abscess is developed, and this gradually destroys the bony wall. A free incision and complete emptying of the contents of the cyst is the only rational treatment. Borthen recommends daily syringing the cavity with a warm solution of boric or salicylic acid, and the introduction of a drainage tube. After three or four weeks of this treatment, the patient may be sent home, and the treatment carried on there.

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#### FURTHER OBSERVATIONS ON THE EXTRACTION OF INTRAOCULAR CYSTICERCI.

VON GRAEFE publishes his observations upon a series of 45 cases of intraocular cysticerci, within a period of ten years, in which operations for their removal were performed (*Archiv für Ophthalmologie*, xxxi. 4). The extraction was a complete success in 30 cases. The percentage of positive success was therefore 67 per cent., and of negative result about 33 per cent. The average time spent in hospital by all the favorable cases was two weeks. Only one ran an unfavorable course, and this was probably due to the fact that a large amount of vitreous was lost before the parasite was extracted. Most of the unfavorable cases were those in which the parasite was freely movable in the vitreous, and more or less disconnected with the coats of the eye, and was, moreover, surrounded by dense opacities. The cases in which the cysticercus occupied a subretinal position are the most favorable for operation, because it presents at the opening almost as soon as the incision is made. Graefe's method of operating is as follows: After localization of the parasite, one of the four straight muscles is divided, about one millimetre from its scleral insertion. Through the end of the divided tendon a catgut suture is passed, armed at each end with a needle. The sclera is then more freely exposed and the muscle carefully dissected back, so as to make room for the incision in the

sclera. The meridional incision is then to be slowly and carefully made in the sclera, so as to divide only the sclera and choroid. After the extraction of the parasite and a careful cleansing of the wound, the divided muscle is to be reattached to the stump of the divided tendon, the sutures passing through the subconjunctival tissue, and being brought out close to the corneal margin.

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#### A CASE OF RIGHT LATERAL HEMIANOPSIA, WITH AUTOPSY.

WILBRAND'S paper is a very elaborate one and difficult of abstraction (*Archiv für Ophthal.*, xxxi. 3). The patient was a man, aged sixty-three, who was suddenly attacked by a right lateral hemianopsia, which was at first incomplete, but soon became complete and absolute. There was double "choked disk" and impaired vision in the left eye, and normal vision in the right eye. The color sense was normal, as was also the peripheral part of the left visual field. After several weeks an apoplectic right hemiplegia appeared, without loss of consciousness, with paralysis of the right facial and hypoglossus. There was no great disturbance in sensation, but there were marked vasomotor disturbances of the right extremities. Later the hemiparesis diminished, but there ensued frequent contractions of the muscles of the right arm and leg. Aphasia gradually supervened, and the left halves of the visual field became concentrically limited. Three years later the patient committed suicide. A review of the case shows that two centres of disease were developed in the left hemisphere, with an interval between them of several weeks. The first was probably a tumor in the left occipital lobe. But the autopsy showed, in place of the tumor, a spot of softening caused by emboli of small cerebral vessels. The softening extended in a sagittal direction as far as the cortex of the end of the occipital lobe. As the cortex of the visual centre in the occipital lobe is the only spot in which light is perceived, it follows that the various photopsic manifestations, as signs of spent irritation, can only be perceived in this same spot. A small focus of disease at first hindered the optical conductivity to the visual centre, without completely destroying it; but new foci of disease increased the visual defect, and eventually entirely destroyed the conductivity—complete and absolute hemianopsia. Wilbrand thinks it may be assumed that by the sudden influx of cerebrospinal fluid toward the region of the obstructed vessels, and the consequent sudden diminution of tension in the walls of the ventricles, the ependyma was irritated, and this was followed by an increased secretion of cerebrospinal fluid. The occipital lobe having become œdematous, the whole intracranial space was gradually diminished, and the increased quantity of cerebrospinal fluid was driven into the sheath of the optic nerve, and the latter was stretched or distended. Later, when the atrophic contraction of the occipital lobe began, and the intracranial space became again greater, there was a recession of all the symptoms of "choked disk." The history of this case proves that in embolic softening of the hemispheres the ophthalmoscope may show "choked disk." This case also shows that a contraction of the sagittal medullary fibres, and a softening of the cortex of the under surface of the left occipital lobe, of the posterior half of the gyrus hippocampi, and of the posterior half of the third temporal convolution, with right lateral hemianopsia, may cause symptoms of aphasia. The descending atrophy of the left optic tract through the



chiasm into the optic nerve is probably due to the softening of all the primary centres of the optic nerves, especially of the corpus geniculatum externum. It is probable that the latter body serves as a reflex nutritive centre for the optic tract, chiasm, optic nerve, and retina.

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#### THE ETIOLOGY OF SUPPURATION AND INFLAMMATION AFTER THE EXTRACTION OF CATARACT.

WECKER's third article (*Annales d'Oculistique*, Nov.-Dec. 1885) begins with a rigid differentiation between a mediate and immediate inoculation or infection. He regards it as a very difficult matter to arrest a suppurative process which has manifested itself within twenty-four hours after the operation by a marked increase of the conjunctival secretion, a rapidly occurring chemosis, turbidity of the aqueous, and violent ocular and periorbital pain. He emphasizes the necessity of great care in maintaining the absolute cleanliness of all instruments by prolonged immersion in absolute alcohol or in the flame of a lamp. Care must be taken that the instruments touch no part of the head or eye of the patient, except the points involved in the operation. All eversion of the flap or contact of its internal surface with the margin of the lid must be carefully avoided in order to escape the possibility of what Wecker calls "intraocular infection." He thinks that the modern flap operation is as free from the dangers of suppuration as is the peripheral linear incision. He agrees with Horner in believing that the great majority of rapid suppurations occur after the reestablishment of the anterior chamber, and that the prolonged efflux of the aqueous humor acts favorably against suppuration. He insists that the constitutional changes which the tissues of the eye may present cannot alone furnish sufficient cause for the development of a suppurative process in the cornea and eyeball; that they only predispose to an easier evolution of the infecting germs coming from without. Moreover, the alterations and lesions which accompany traumatic shock and contusion are purely predisposing, and do not necessarily lead to suppuration without the intervention of the irritation which furnishes the infecting germ. The supuration depends solely upon the infection of the lips of the incision in the eye, or upon the introduction of infecting germs into the interior of the eyeball. The antiseptic methods of operation and treatment must be persisted in the more carefully if the condition of the patient predisposes to a less exact coaptation of the lips of the wound and a consequent retardation of the healing process. An extremely peripheral wound, and the addition of an iridectomy, increase materially the danger of inflammation following the extraction. The nearer the incision is made to the non-transparent part of the cornea, the less is the height of the incision, and the less is the gaping of the wound necessary to the free extrusion of the lens, the greater, also, are the dangers of the iris being caught in the angles of the wound. He considers that a simple extraction by a flap incision does away almost entirely with the danger of the occurrence of irido-choroiditis in the other eye, which has been observed not infrequently after the linear extraction combined with iridectomy.



### DEMONSTRATION OF TUBERCLE BACILLI IN TUBERCULOSIS OF THE CONJUNCTIVA.

ULRICH's report is very interesting (*Centralbl. f. prakt. Augenheilk.*, Decem-ber, 1885). The patient was a man aged thirty-two, who for three years had complained of swelling of the lids, lachrymation, and muco-purulent secretion of the right eye. The lids were thickened, and there was ptosis. The lower half of the palpebral conjunctiva of the lower lid, the inferior cul-de-sac, and a narrow margin of the ocular conjunctiva were the seat of an ulceration, reaching from external to internal canthus, with irregularly eroded, undermined margin, and grayish opaque base. A few granulations, which bled easily, were at the bottom of the ulcer. The rest of the conjunctiva was thickened, velvety, and injected. The same thing existed in the upper lid, with three small ulcers near the outer canthus. The semilunar fold and caruncle were hypertrophied; the cornea was intact; the patient had a well-marked family history of tuberculosis, and suffered himself from cough, expectoration, and hæmoptysis. The conjunctiva of the lower lid was excised and hardened for examination. It was found changed into a vascularized granulation tissue, and filled with large and small circumscribed tubercle nodules, with central caseous degeneration. Here and there were patches of diffused tubercular infiltration. Tubercle bacilli were easily and distinctly visible.

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### CORNEAL STAPHYLOMATA AND ANTERIOR SYNECHIÆ, AND THEIR RESULTS UPON THE EYE.

ABADIE's article is a practical one (*Arch. d'Ophthal.*, Nov.-Dec. 1885), and is mainly devoted to a description of his method of operating in such cases. When he wishes to prevent the increase of a staphyloma or to divide an anterior synechia, he punctures the cornea with a narrow cataract-knife at the margin of the staphyloma, but in intact corneal tissue. If there is no anterior chamber he divides the iris, passes into the posterior chamber, and makes his counter-puncture in the cornea on the other side of the staphyloma. Then, by a to-and-fro motion, the base of the staphyloma is divided carefully, leaving a small bridge of conjunctival tissue so that the wound may not gape too much. In the case of a delicate anterior synechia, without any alteration in the curvature of the cornea, this bridge may be divided by the narrow knife as in the previous operation, or by the pince-ciseaux of De Wecker. It should not be forgotten that these delicate narrow anterior synechiæ often are as likely to lead to disorganization of the eye as those which are very broad and extensive.

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### ON CERTAIN OPERATIONS UPON THE EYELIDS.

LANDOLT's paper (*Arch. d'Ophthal.*, Nov.-Dec. 1885) begins with the description of an operation for ectropium. He begins by making a deep conical incision in the ectropium through the entire length of the lid, and close to its edge. Two or three millimetres from this a second analogous incision is made which meets the second in the deep tissues of the lid. The two incisions thus form the radii of the everted pad or portion of

the lid. The conical piece is then excised, and two or three of Snellen's sutures are introduced and tied over pieces of drainage tube in such a manner as to produce a well-marked entropium. This assures the juxtaposition of the lips of the wound and a resisting cicatrix. A careful antiseptic dressing is then applied and renewed twice a day. The ligatures are removed on the fourth or fifth day, and the artificial entropium at once disappears. In cases of distichiasis Landolt suggests a modification of the Jæsche-Arlt operation as follows: Instead of making the second incision a curved one with convexity upward, he makes the two incisions parallel, and the extremities of the strip are divided by scissors. In this way the loss of substance becomes rectangular, and the effect produced on the lashes by the reunion of the margins of the excision is more marked. In separating the lid into two leaves he cuts around the entire lower border of the tarsus, so that the strip of skin may surely comprise all the abnormal lashes. In severe cases of distichiasis he detaches or dissects up the external or anterior leaf of the lid with the ciliary margin, and cuts out a rectangular piece of the skin from the lid surface. He then introduces sutures in the upper border of the strip, but instead of bringing them out at the upper margin of the wound he carries them subcutaneously above the eyebrow, brings them out, and then ties the knots over pieces of drainage tube in this locality. In cases requiring blepharoplasty of the lower lid he carefully detaches the conjunctiva along the entire orbital margin and dissects it up freely as far as the eyeball. He then makes an incision parallel to the palpebral margin in the upper lid and distant two mm. from it, reaching from one end of the lid to the other, and extending as deep as the tarsus. A second incision is then made of the same length as the first and parallel to it, and distant from it seven mm. This flap is then dissected free, leaving the ends still attached, and is lowered and placed in position over the raw surface of the inner or conjunctival leaf of the lower lid. The transplanted flap is then carefully stitched into its new position by numerous fine sutures, and the wound in the upper lid is closed in the same manner. Landolt claims excellent results from this method. He believes highly in the great value of a method of operating based upon the utilization of the two separate leaves of the lid, an anterior or external and a posterior or internal, and gives an account of several cases which have been operated upon successfully in this manner.

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#### EXTRACTION OF A CYSTICERCUS FROM THE VITREOUS HUMOR.

HALTENHOFF (*Annales d'Oculistique*, Nov.-Dec. 1885) reports an interesting case of this nature in a man aged thirty-eight. The steps of the operation were as follows: The patient was placed on his back, and a carbolyzed silk ligature was passed under the conjunctiva in front of the insertion of the inferior rectus, the two ends were tied and given to an assistant to direct the movements of the eye. The conjunctiva and capsule of Tenon were then divided somewhat obliquely parallel to the external border of the muscle, beginning at a point half a centimetre from the corneal margin, and about twelve millimetres long. The tissue was carefully dissected away from the eyeball, leaving the sclera exposed. The patient was then placed in a sitting posture, with the head bent slightly forward and to the right. The sclera was then punctured at the posterior end of the wound, and incised

from behind forward. As soon as the wound gaped, a grayish-white membrane appeared, and as the incision was completed, the entire sac containing the animal made its exit from the eye. The wound was not closed by sutures, and simple borated dressings were applied. The wound healed rapidly, though a slight iritis occurred, and the patient was discharged on the eighth day. Two months after the operation the vision was  $\frac{3}{L}$ .

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#### ON THE INSPIRGATION OF POWDERED JEQUIRITY IN CASES OF TRACHOMA.

ALT has been using the powdered jequirity in place of the solution, for the cure of trachoma, and draws the following conclusions (*Amer. Journ. of Ophthalm.*, Nov. 1885): 1st. The inspersion of jequirity powder seems to be a much safer method of applying the drug than the solutions 2d. The effect can be well regulated and almost confined to a small portion of the lid. 3d. In order to produce this effect in the way just mentioned, the powder must be applied directly to the parts to be affected by it. 4th. A peculiar gray infiltration of the granules, a few days after the inspersion, will give an idea of what number of granulations are going to disappear.

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#### REMARKS ON THE PHYSIOLOGICAL ACTION OF COCAINE.

This paper by EVERSBUCH (*Centralblatt für prakt. Augenheilk.*, October, 1885) is of some interest. He begins by reviewing a paper by Pflüger, and criticising certain statements in it. He thinks that the effect produced on the conjunctival vessels by the local instillation of cocaine, may also be expected in the vascular system of the iris and ciliary body. As regards its action on the ciliary muscle, Eversbusch considers the cycloplegia, like the paralysis of the sphincter iridis, to be due to ischæmia of the muscular tissue. It is evident that with a diminished blood-supply to the ciliary body, the power of contractility of the ciliary muscle, which forms the bulk of the ciliary body, will also be diminished. A similar condition is met with in the weakness of accommodation occurring in various forms of secondary or idiopathic anæmia, or after exhausting diseases. According to Weber, cocaine causes a distinct diminution of the corneal tension, which must be, at least in great part, attributed to a diminution of the intraocular pressure. Eversbusch thinks, however, that the accommodation is not lessened or paralyzed by a single instillation of cocaine hydrochlorate, even in a five per cent. solution, but that repeated instillations will produce a more or less marked paralysis of accommodation, though always of slight duration.

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#### THE DANGERS OF COCAINE.

At a meeting of the Ophthalmological Society of the United Kingdom (*Ophth. Review*, Dec. 1885), NETTLESHIP asked whether the gelatine disks of cocaine had proved entirely satisfactory in the experience of the members of the Society. His suspicions had been excited by the occurrence of a run of serious cases of panophthalmitis at St. Thomas's Hospital, while at the same time the cases at Moorfields had done well. At the former hospital he had employed gelatine disks of cocaine, and Messrs. Savory and Moore had in-

formed him that as cocaine was hygroscopic, the gelatine disks were always moist, and that it was impossible to keep them thoroughly dry. It was possible that the disks might afford a breeding-ground for pathogenic organisms. Solutions of cocaine also apparently had a tendency to cause panophthalmitis and chronic interstitial keratitis.

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#### A CONTRIBUTION TO THE EMPLOYMENT OF MASSAGE IN OPHTHALMIC THERAPEUTICS.

DANTZIGER makes an earnest appeal for the more frequent employment of massage in certain chronic diseases of the conjunctiva and cornea. He thinks that the massage should not be dry, but should always be made with some oleaginous material like an ointment, and recommends a salve made of hydrarg. præcipitat. flav. 0.1 part, and vaseline 6 parts. A small portion of this is introduced into the cul-de-sac, and the lids are then closed. The index-finger of the right hand is then placed on the centre of the upper lid, and slight rubbing movements from right to left are made over the eyeball, through the medium of the lid. The massage is done once a day, for a period of half a minute, and should be methodical, delicate rubbing. In cases of old corneal opacities, this massage must be persisted in for a long time before any effect is seen. It acts in a mechanically depleting way, stirring up old, torpid exudations and organized products of inflammation in the cornea, and pressing them into the lymph channels. It also acts as a direct source of irritation, and thus hastens absorption of exudations.

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#### THE TREATMENT OF DISEASES OF THE NASAL DUCT BY THE AID OF IRRIGATION.

The paper by ANNUSKE (*Archiv für Ophthalmologie*, xxxi. 3) is based upon an old idea, though the method in which it is carried out is somewhat novel. He makes use of curved canules of a peculiar shape, and connects them with an irrigating vessel by means of a piece of rubber tubing about a metre and a half long. He first divides the upper canaliculus as far as the lachrymal sac, and then incises the nasal duct by means of a Stilling knife. He then introduces the canule into the lachrymal sac and opening of the nasal duct, and injects a varying quantity of ice-water through the duct. He treats nearly all the different diseases of the sac and duct in this way, and never uses any probes in the duct. Care must be taken to avoid placing the irrigating vessel too high above the patient's head, or the water may pass into the subcutaneous cellular tissue and cause considerable pain. He usually employs from a litre to a litre and a half of ice-water. If the case be one of purulent inflammation, he uses three parts of water and one part of a one per cent. carbolic acid solution. If the discharge of pus is profuse, he injects a certain proportion of a one or two per cent. solution of carbolic acid before using the ice-water. He also varies the temperature of the water according to the case, and in cases of pure stenosis of the duct, in elderly people, he even employs lukewarm water. He irrigates once a day for about four weeks, and then gradually diminishes the frequency of the application, and claims better success, in all cases, than by any other method of treatment.



## HINTS FOR CATARACT OPERATIONS.

ARLT's paper (*Archiv für Ophthalmologie*, xxxi. 3) is a very practical one, abounding in hints and suggestions in diagnosis, pathogenesis, etiology, and treatment. One of the earliest points to determine is whether the clouding of the lens is the sole cause of this disturbance in vision, or only a secondary and assisting cause. If the opacity is progressive, and extends over the greater part or the whole of the lens, it must be made clear to both surgeon and patient what will be gained in sight under the most favorable circumstances, and what will be lost under the most unfavorable. Arlt thinks that humanity forbids us to wait until the second eye has become blind before operating upon the first eye. When both eyes are ready for operation, prudence suggests that only one eye should be operated upon at a time. Of course, it must be considered what influence is exerted upon the functional activity of the retina by the continued presence of a cataract of the congenital variety. When, in such a case, an operation is deemed advisable, it is better to perform it while the child is still very young, even in the nursing age, for at this period of life the retrogressive metamorphosis is much more rapid, and the removal of hypermature, shrunken cataracts, is in general more difficult than when the lens is simply cloudy, and the capsule is still unchanged. In the operation of extraction, the location of the incision in the scleral margin involves the conjunctiva in the wound, and this may be made use of to form a conjunctival flap, to aid in early closing of the wound. Arlt does not make his incision as far back in the sclera as Graefe proposed. He prefers to make an iridectomy, because it would be with difficulty avoided in such a peripheral incision; but he makes a narrow coloboma, and cuts out only a small piece of iris. After the capsule has been opened and the cataract extracted, he lays special stress on the necessity of carefully removing all the soft lens fragment that may have remained behind within the eye, by gentle pressure and counter-pressure, and by movements of massage. In some cases it is absolutely necessary to make the iridectomy some weeks previous to the extraction, though in most cases this may be dispensed with.

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## A NEW METHOD OF OPERATING UPON UNRIPE CATARACTS, WITH A CONTRIBUTION TO THE SUBJECT OF ANTISEPSIS IN OPHTHALMIC SURGERY.

WICHERKIEWICZ (*Klin. Monatsbl. f. Augenheilk.*, Nov. 1885), in this paper, offers a substitute for the combined iridectomy and massage, followed later by extraction, which Förster proposed to employ in cases of immature cataracts. In suitable cases he makes the modified linear section of von Graefe with a moderate conjunctival flap and an upward iridectomy. A circular piece of the capsule is then excised and removed with the iris forceps. By slight pressure upon the cornea the nucleus is extruded, and with it a quantity of the soft lens matter. He then takes a peculiarly constructed glass irrigator, with one long curved jet-pipe furnished with a silver end-piece, and a short, straight tube, by which the irrigator is filled. The irrigator having been filled with a one per cent. solution of boric acid, first boiled and then allowed to cool to a temperature of 30° C., he takes it in his hand, covering the entrance tube with one index-finger, and carefully introduces the silver end of the long

tube into the anterior chamber as far as the margin of the pupil and behind the iris. The index-finger is then removed from the other opening, and the pressure of the atmosphere drives the fluid out of the irrigator into the anterior chamber, and washes out the soft lens matter through the wound in the cornea. This irrigation is continued until all the cortex is removed, and the pupillary space appears black and clear. The eye is then washed and bandaged in the usual antiseptic manner.

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#### THE EMPLOYMENT OF DISKS OF GELATINE FOR THE OCCLUSION OF THE CORNEAL WOUND, AFTER THE EXTRACTION OF CATARACT.

GALEZOWSKI'S ingenuity seems irrepressible (*Recueil d'Ophthal.*, Oct. 1885). He proposes to bring about the rapid healing of the corneal wound by preventing the entrance of microbes from without, and thus avoid all possibility of suppuration, by covering the whole length of the wound with a disk of gelatine, which is caused to adhere in an ingenious manner to the surface of the eyeball. He composed a sort of gelatinous court-plaster, which is perfectly well borne by the eye, which adheres to the wound, dissolves little by little, and disappears at the end of eight or twelve hours. These little disks of gelatine are 0.5 mm. thick, and both surfaces are covered with a concentrated solution of cocaine, to which a weak solution of mercuric bichloride has been added, in the proportion of 0.25 gramme to 1000 grammes. One surface of each disk is covered with a glue which attaches it lightly to the cornea, and prevents it from being displaced by the movements of the lids. When all is ready the disk is slightly moistened in warm water, introduced beneath the upper lid, and placed over the wound; the lids are then replaced carefully, and the bandage is at once applied.

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#### AN INTERNAL LACHRYMOTOME.

In the *Recueil d'Ophthal.*, Oct. 1885, MENGIN describes a new instrument which he has devised for the lachrymal passages, which is simply a modification of Galezowski's knife. The shank is round, 12 mm. long, and diminishes gradually in diameter from a millimetre to half a millimetre. The blade is very delicate, and its entire circumference is a cutting edge; it is 4 mm. long and 1 mm. wide, and the angles are rounded. This blade may be introduced through the lachrymal canals without wounding the walls. An obstruction having been found in the duct, the instrument is introduced through the lower canaliculus until it reaches the obstruction, when it is pushed through and divides the stricture. When it is felt to have entered the lachrymal sac, it is withdrawn to the point of stricture, turned partially round and again pushed forward, and this manœuvre is repeated as many times as may be deemed necessary.

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#### KERATITIS DENDRITICA EXULCERANS MYCOTICA.

In this paper (*Centralblatt für prakt. Augenheilk.*, October, 1885) EMMERT presents a hitherto undescribed form of ulcerative inflammation of the cornea, illustrated by six cases. From the histories of these cases he concludes that phthisical and scrofulous persons in tolerable health are most liable to be attacked by this form of arborescent keratitis, and mainly between the ages

of twenty and forty-five years. The disease attacks both sexes with about the same frequency, and usually those people who have never before had any inflammation of the eyes. It usually occurs spontaneously in late winter, spring, and autumn, and spreads very rapidly, often reaching its height within two or three days. The symptoms are photophobia, lachrymation, swelling of the conjunctiva of the upper lid, injection of the ocular conjunctiva, a grayish subepithelial opacity of the cornea, which begins either as a small infiltrated spot with branching processes, or as a narrow streak which extends, divides, and sends out processes. The epithelium of this opacity soon becomes elevated and cast off, leaving little furrows in the cornea. As the loss of epithelium extends the reflex blepharospasm increases, and the ulcerative action usually extends through the anterior elastic lamina into the corneal tissue proper. The patients sometimes complain of neuralgic pains in the temple. The usual duration of the disease is from three to six weeks, though it may be cut short sooner by frequent instillations of the cul-de-sac and ulcerated spots with mercuric bichloride solutions and eserine. The opacities remain for weeks and months, but gradually clear up without leaving facets behind them. The pathology and pathogenesis of this disease are somewhat difficult of explanation. When the process begins with a superficial loss of epithelium, we naturally think of some infection from without at that particular spot, in default of which the lesion would remain a simple, superficial, ulcerative keratitis, and when we consider the double bacilli which are found in the deeper epithelial layers, this idea of infection from without receives strong support. So strong is this probability that we at once look for some point of entrance in the cornea, and if one is not found we assume its existence, or else assume that the infecting bacilli immigrated from the ocular conjunctiva. The disease is not a constitutional one, or it would be met with much more frequently. It must be regarded as a mycotic corneal inflammation, at the bottom of which, however, is a strong constitutional predisposition to the rapid development of mycosis.

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#### A CASE OF TRAUMATIC CATARACT TREATED BY ASPIRATION.

This odd method of operating has recently been practised by ROGMAN (*Annales d'Oculistique*, Sept.-Oct. 1885). The patient was a man aged thirty, who was struck in the left eye by a piece of iron, which perforated the centre of the cornea and wounded the lens. There was blood in the anterior chamber, and the latter and pupillary space were filled with soft lens matter. Six weeks later the operation by section was performed. The hands, instruments, and face of the patient were carefully disinfected and the eye was anæsthetized by cocaine. The cornea was perforated by a broad needle near the centre of the internal quadrant. Subconjunctival injection became very marked, and a small amount of blood appeared in the anterior chamber. The canula of the aspirator was then introduced and suction begun. With each movement of suction, the iris was drawn toward the eye of the canula, and the operation was ended before the pupil was entirely cleared. Cold compresses of mercuric bichloride (1:2000) were then applied, and when all pain had ceased, an antiseptic dressing was put on. The next morning there was profuse secretion and the eyeball was markedly injected, but there was no pain. Four leeches were applied to the temple and the cold applications



were continued. On the second day all inflammatory symptoms had subsided, and the few flocculent masses in the pupil and anterior chamber were absorbed in a few days. The opaque capsule gradually receded, and the pupil became eventually entirely black. The suction instrument employed was that devised by Mr. Teale, and proved entirely satisfactory.

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THE CURE OF PROGRESSIVE MYOPIA BY IRIDECTOMY AND SCLEROTOMY.  
THE CIRCULATORY THEORY OF MYOPIA.

In this article (*Annales d'Oculistique*, Sept.-Oct. 1885) DRANSART undertakes to prove that the muscular and accommodative theories of the causation and development of myopia, as formulated by von Graefe and Javal, are faulty, and insufficient to explain the facts; and he substitutes for them the circulatory theory of the origin of myopia. He starts out with the assumption that the myopic process is primarily caused by the increase of the intraocular fluids, and secondarily by the distention of the ocular coats. The increase of the intraocular fluids is the expression of a circulatory disturbance consisting in a too abundant secretion, or in an insufficient excretion, or in both. These conditions are found in glaucoma, and the difference which exists between the glaucomatous process and the myopic process consists in the fact that in one case the coats of the eye are more resisting and do not yield, while in the other case they do yield, and the excess of tension is not appreciable in consequence of this increase of capacity. Dransart's therapeutic methods are recommended in cases of progressive myopia in which blindness threatens, with or without lesions of the coats or of the media. When the visual acuity is less than a quarter and is progressively diminishing, Dransart performs either a sclerotomy or an iridectomy, but he regards either as an heroic procedure. The analogy between glaucoma and myopia receives brilliant confirmation by the therapeutic results obtained in this way. The myopia may end in glaucoma, and the glaucoma may give rise to myopia. Hence the author reasons that the circulatory theory, which explains the production of glaucoma, will also explain the genesis of myopia. He thinks that in the future, sclerotomy or iridectomy must be performed in those cases of progressive myopia in which the visual acuity is reduced to a quarter or even less, and in which the tendency to progression has not been arrested by ordinary therapeutic measures. These operations arrest the progress of the disease, maintain the actual amount of visual acuity, and even double it, and may restore it when totally abolished.

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OTOLOGY.

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UNDER THE CHARGE OF

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FRACTURE OF A SMALL PORTION OF THE TYMPANIC PLATE FROM  
EFFORTS TO REMOVE A PIN SUPPOSED TO BE IN THE EAR.

This unfortunate result of unskilful manipulation for the removal of a foreign body supposed to be in the ear occurred in a woman, fifty years old, who was brought, subsequent to the lesion, for treatment of the inflammation



in her ear, to DR. THOMAS BARR, of the Glasgow Hospital for Diseases of the Ear (*Archives of Otology*, vol. xiv. 239-241, Dec. 1885). It appears that the woman habitually scratched her ear with a pin, in order to relieve itching in the organ, and upon one occasion, while in bed, she fancied the pin had slipped into her ear, which she had been scratching before going to sleep. Impressed with this erroneous idea, she hastened to a physician, who, taking the woman's statement of her impression for a fact, proceeded to make efforts at removal of the pin by means of forceps. These efforts were rough, and very painful to the patient. At first no result beyond pain was obtained, but finally the forceps were made to grasp something, and the physician, whose arm was aided by traction on the part of the patient's husband, succeeded in getting something out. It was, however, neither a pin nor a portion of one. After this, for four weeks, the woman suffered a great deal of pain and nervous prostration, sleep being almost impossible.

Dr. Barr found purulent secretion in the orifice of the affected auditory canal, and a polypoid growth was also found near the meatus, blocking the entire lumen of the canal, and apparently attached to its antero-inferior wall. This growth was removed, and its attachment was found to mark an opening in the soft parts, leading to a hard, rough, slightly movable substance, in the position of the rough outer edge of the tympanic plate. In the antero-superior quadrant of the membrana tympani there was a small perforation, from which muco-pus escaped from the drum cavity. The hearing was very defective, being for the watch  $\frac{\text{contact}}{40}$ . A few days after this examination there were removed from the canal of the ear "two pieces of semi-dead bone," evidently from the edge of the tympanic plate. In two weeks from this time the ear had entirely healed, the perforation in the membrana tympani had closed under proper treatment, and the hearing improved.

This is another instance of the evil consequences of an endeavor, on the part of a very unskilful man, to remove a foreign body from the ear before it has been ascertained whether or not a foreign substance is really in the organ. In this instance, as Dr. Barr observes, the pin either did not get into the ear at all, or, if it did, it must have fallen out soon after it slipped in, unknown to the patient. The physician she consulted first, taking her statement for granted, assumed the pin was in the ear. In his endeavor, then, to remove it, he seized the antero-inferior angle of the tympanic bone at the junction of the cartilaginous and osseous parts of the auditory passage. Such a seizure of bony substance would convey to an operator without experience that he had laid hold of a foreign substance, and his mind imbued with this erroneous idea, he would then make excessive efforts at removal of the object. In this case the efforts at traction were very great, and at last a snapping sound was heard, and, although the operator removed nothing, he desisted from further efforts. The subsequent inflammation, aided by constant poulticing, accounted for the suppuration, polypus, and perforation of the tympanic membrane.

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#### LACERATION OF BOTH MEMBRANÆ BY UNSKILFUL ENDEAVORS AT REMOVAL OF FOREIGN BODIES FROM THE EAR.

BÜRKNER, of Göttingen, has related a case which demonstrates the danger of the endeavor, on the part of unskilful persons, to remove foreign bodies from the ear (*Archiv f. Ohrenh.*, Bd. xxii. p. 203).

It appears that a girl, seven years old, put two lentils in each ear, in play. Although the child was not suffering at all, the village doctor was instantly summoned, and armed with a large forceps, but without any speculum, proceeded to search for the foreign body. As this rough treatment produced considerable hemorrhage, and as the child was restless under the infliction, a continuation of the search was postponed until the next day, and then one ear was emptied of its foreign contents. The other ear was cleared on the third day, after a long process of boring, under chloroform. It is stated that various instruments were used in this last operation. The child suffered greatly on the days of these operations and all the rest of the week.

Soon after the last operation pus began to flow from each ear, and therefore the child was brought to Bürkner's clinic. It was found that the auditory canals were greatly swollen, deprived of epidermis over a considerable surface, and filled with fetid pus. Both membranæ were deeply congested and swollen, and presented deplorable evidence of the roughness of the treatment. The front and lower part of the right membrana tympani was entirely torn away. The left membrane was ruptured both behind and in front of the malleus, and between the two openings thus formed was a thin band of tissue covered with blood. The manubrium on both sides was invisible. For three weeks the membranæ remained thus swollen; then, gradually, the edges of the perforations became smoother, and on the left side the two perforations coalesced, and both drums remained perforated. The suppurative discharge ceased in the course of a few weeks. The hearing at first was almost entirely suspended; but gradually it improved a little, so that, finally, on the right side it was  $\frac{5}{150}$ , and on the left  $\frac{3}{150}$  for the watch, and it has remained at this low point up to the present time. No treatment could improve the hearing; hence it seems that in the rough endeavor at extraction the ossicles were wounded. This is another instance proving that no one but the specially skilled should use instruments to remove foreign substances from the ear, and that no one, no matter how skilful, should resort to instruments until syringing with warm water has been tried and found insufficient. In this case, as in numerous others, it was the rough treatment, and not the presence of the foreign body, which did harm. To act as this surgeon did toward his little patient is malpractice, and should be punished as such.

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#### A NEW TELEPHONIC APPARATUS FOR EXAMINATION AND TREATMENT OF THE ORGAN OF HEARING.

DR. L. JACOBSON, of Berlin (*Deutsche med. Wochenschrift*, Dec. 31, 1885), has devised an instrument of the above-named character, for the treatment of some kinds of deafness, by a form of passive motion, denominated by Lucæ "sound-treatment." In this treatment the source of sound is a tuning-fork, formerly used for diagnostic purposes only, but in this new way, employed as a therapeutic agent. Prof. Lucæ<sup>1</sup> states that he has succeeded in a series of cases of subjective aural sounds in entirely banishing the latter, or in essentially relieving them by his so-called "sound-treatment." In order to accom-

<sup>1</sup> Zur Entstehung und Behandlung der Subjectiven Gehörsempfindungen, Berlin, 1884. Otto Euslin.

plish this, external sounds are allowed to act upon the affected ear, from one to ten minutes daily. Deep notes are employed when the subjective sounds possess a high character, like whistling or singing, and high notes are employed when the subjective sounds are deep, like the sound of bells, roaring, humming, etc.

In order to produce a continued sound, it is recommended to use the interruption-tuning-forks of Helmholtz, especially the  $c$  fork for a deep note, and for high ones the ordinary forks  $c^3$  and  $c^4$ , as these notes are not so easily produced by the electromagnetic interruption-tuning-forks. Since the pitch of the subjective sounds which come under treatment vary greatly, it seems desirable, in the method of treatment just mentioned, to be able to employ a great variety of notes. To procure a large number of electromagnetic tuning-forks, however, would be exceedingly costly, as one such costs seventy-five marks (German). This fact has induced Dr. Jacobson to have constructed an apparatus, at once comparatively cheap and capable of producing a large number of constant tones lying within four or five octaves, viz., from contra  $c$  to  $c^3$ .

It consists of an induction apparatus, the secondary spiral of which is connected with a telephone, while the primary circuit contains one or several elements, besides an automatic interruption-apparatus. The latter is somewhat like the Wagner-Neef hammer, but differs from it in having several springs for interrupting the current, which, by a simple arrangement, can be connected with one another, and by virtue of their dissimilar dissonance can evoke a varied number of current-interruptions in a second, in the primary circuit. The telephone must, therefore, by the insertion of different springs, receive an unequal number of current impulses, and, hence, emit a variety of high notes.

It is claimed by Dr. Jacobson that the notes produced by his instrument exceed in intensity those of electromagnetic tuning-forks. Besides being of use in the so-called "sound-treatment," the apparatus may be used as a means of testing the hearing. By means of this apparatus, it is claimed that notes of fixed intensity and various pitch may be used by bone-conduction through the head, if into the receiver of the telephone a bar be fixed, the free end of which rests on the skull. This test can be employed even in those whose hearing is already greatly impaired, because the sound from the telephone would be heard by aerial conduction, by a good ear, before the aforesaid bar extending from the telephone could be placed in contact with the cranium. In such a case it would be impossible to test the perception by bone-conduction, in isolation. The purity of the tones evoked by this apparatus is not equal to that produced by electromagnetic tuning-forks, but this is not considered of moment in the object for which the apparatus is used.

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#### THE MECHANICAL TREATMENT OF THE MEMBRANA TYMPANI AND THE OSSICULA AUDITUS.

The subject of passive motion in the treatment of chronic aural disease, especially chronic catarrh of the drum cavity and the mucous covering of the auditory ossicles, is further illustrated by the observations of DR. ADOLPH HOMMEL, of Zurich, upon himself and a few patients (*Archiv für Ohrenheil-*



*kunde*, Bd. 23, pp. 17-30, Dec. 1885). The writer of this article is not an aurist, but his observations upon himself and his few aural patients are very interesting, and if they have been made accurately, are worthy of attention. His method of procuring curative, gymnastic effects upon the membrana and the ossicles consists in the following: As is well known, pressure inward of the tragus upon the external auditory meatus produces an air-tight closure of the canal. By means of such a sudden closure the membrana tympani is impinged upon by a wave of condensed air, and driven inward. If now immediately the pressure is removed from the tragus, the wave of compressed air is reflected from the membrana, and a momentary slight rarefaction of the air in the canal is brought about, which permits of a recoil on the part of the membrana, from its tension, so that each movement inward of the membrana is followed by a counter-movement outward with all its attachments. By repeated efforts of this kind, an inward and outward movement of the drum membrane can be kept up as long as desired. Dr. Hammel believes that a rhythmic motion of 120 vibrations per minute possesses the greatest advantages, as this form of the procedure produced the best results in his own case. He asserts that in his own case, chronic aural catarrh, all the usual methods of treatment failed, and some of them he thinks made his hearing worse. He proposes for his method the name of "tragus pressure."

In his own case he began this treatment in 1881, his hearing being 10 cm. for watch in the left ear, and 150 cm. in the right ear. Bone conduction was good on both sides. At the present time his hearing for the same watch is 610 cm in the right ear, and 40 cm. in the left. An opacity, observed in the right membrana tympani, before this treatment began, is said to have disappeared. This result is attributed to the stimulation of the lymphatic system in the membrane, and a consequent absorption of the products of inflammation.

In another case—catarrh of the drum—the hearing rose from 150 cm. to 610 cm.; in another instance in which there was a perforation in the left membrana, the hearing rose from 5 cm. to 160 cm., and remained thus improved; and in another case—chronic aural catarrh, with great opacity of the membrane—an improvement from 12 cm. to 340 cm. ensued.

The author recommends the use of "tragus pressure" as a prophylactic against the deafness of old age, since, by the use of this treatment, ankylosis of the ossicles, the chief evil in the deafness of old age, is warded off. "Tragus pressure" is recommended by the proposer as entirely harmless; if, however, it should be used too often and too long at a time, some pain in the ear is excited. It is to be employed from four to six times daily, about 120 times in a minute, for a minute or a minute and a half, thus bringing about from 600 to 1000 movements in the membrana tympani and the auditory ossicles. [The reporter desires to suggest that in the production of the passive motion in the membrane and the ossicles by this method, and all methods which depend upon the motion in, or of, the meatus and cartilaginous part of the auditory canal, the action of the fascia in front of and just above the tragus, also of that part of the deep temporal fascia extending along the anterior margin of the osseous meatus until lost in the anterior ligament of the auricle, must be taken into account. According to Sexton and Pinkerton,<sup>1</sup> the mem-

<sup>1</sup> New York Medical Record, Nov. 17, 1883.



brana tympani can be made tense by traction on this tissue, especially that part known as the membrana flaccida, which is composed in its outer layer by the skin of the auditory canal, while its inner layer is a reflection of the mucous membrane from the attic of the tympanum. Motion in or traction upon the membrana flaccida would be likely to convey some moving force to the upper parts of the ossicles and thus effect passive motion in these parts.]

#### AURAL DISEASES IN DIABETES MELLITUS.

An endeavor has been made in a few instances of late years, to trace an etiological connection between a form of acute otitis media and diabetes mellitus, in which disease there certainly does occur, now and then, an acute inflammation of the middle ear and mastoid portion, not dependent upon an external course, so far as can be discovered by the most careful search. Such cases of a so-called diabetic otitis media have been reported by Griesinger, 1859; Jordao, 1859; Kulz, 1874; and many others, in both Europe and America.

The one fact which seemed in these cases to warrant the assumption that the aural disease was induced by the diabetes, was that simultaneously disturbances in other organs of special sense, viz., in the sight, were present, which, as has long been known, not unfrequently have an etiological connection with this disease. SCHWABACH (*Deutsche med. Wochenschrift*, Dec. 24, 1885) has written on this subject, and relates a case of acute otitis media with mastoid disease, which he observed in a diabetic patient, a man, in 1876, and compares it with a case of similar nature and etiology, recorded by Toynbee (1860), and also with the cases of Raynaud (1881) and Kirchner (1884). Schwabach's patient was forty-five years old, and had never been affected by any previous aural malady. Six years previous the diabetic symptoms had first shown themselves, and for a year later the patient had suffered from general furunculosis, an attendant of diabetes mellitus already recorded by others. At the time of the attack of pain in the ear, the sensations of hunger and thirst were not urgent, the polyuria amounted to 2000–2500 cubic centimetres, the sugar in the urine varied from 2 per cent. to 5 per cent., and the specific gravity between 1.027 and 1.030. Dr. Schwabach first saw the patient on the 16th of May, on account of pain in the right ear, which had kept up for twelve days. The pains became much worse at night, were localized chiefly in the mastoid region, and were attended by intense tinnitus aurium and great deafness. Pressure upon the mastoid produced great pain. The auditory canal was very red and slightly swollen; there was also close to the membrana tympani some mucopurulent secretion, and a pulsating reflection in the lower anterior quadrant. After cleansing the canal, the membrana was found to be slightly congested, swollen, very dull, and the ossicles were not easily seen. In the lower anterior quadrant there was a small pinhead perforation. Politzer's inflation forced some purulent secretions from the drum cavity, and the hearing was thereby slightly improved. The pain in the mastoid region was somewhat relieved by the application of two leeches, and ceased entirely in the course of a few days after the continued application of ice poultices. By the 26th of May, the purulent discharge from the ear had almost entirely disappeared under the use of injections of a one per cent. solution of carbolic acid. On the 28th of May, without any known exciting

cause, intense pain set in again in the mastoid region, and the latter became excessively sensitive to the least touch. The skin over this part became red and swollen, but in the auditory canal there was no trace of pus, although the membrana tympani was redder and more swollen than before. The perforation in the lower anterior quadrant was no longer visible. Paracentesis of the membrana was, therefore, performed in the lower posterior quadrant, but very little purulent secretion was removed even by means of Politzer's inflation. Ice poultices were again placed upon the mastoid region, but the pain did not abate. The swelling behind the ear increased, and an œdematous condition of the parts in front of the ear set in, and reached as far as the right upper eyelid. There also ensued right facial paralysis, with pulse 120, and an elevated temperature. Finally, on the 13th of June, the patient consented to the incision of the mastoid, which had been recommended to him some days before. The incision was first made to the bone, which latter was found extensively necrosed, so that merely cutting through the corticalis with the knife sufficed to expose the mastoid cells, and to free a quantity of offensive pus. After all the softened osseous substance was removed by the sharp spoon, the mastoid cavity was washed out with a one per cent. solution of carbolic acid and an antiseptic bandage laid over the wound. The pain was greatly relieved by this operation. The cavity of the mastoid was washed out daily with cleansing washes, and sometimes with a one per cent. solution of carbolic acid. On the 29th of June, fluids injected through the wound into the mastoid cavity passed into the pharynx, and also escaped from the external auditory meatus. Inflation now also produced the well-known whistling sound of passing air, heretofore not heard. The patient did well until July 17th, when beneath the incision in the mastoid, on the side of the neck, there appeared a red swelling, which grew painful and much larger. In three days an incision was made in it, and a large quantity of pus escaped from it. From this time on the patient recovered, as to his ear, almost entirely. The external auditory canal became paler, less swollen, and the membrana tympani, still dulled, contained a small perforation in the lower anterior quadrant. The facial paralysis was much better. On October 8th a small sequestrum was removed from the mastoid fistula, and after that event the process of healing advanced more rapidly. The facial paralysis now disappeared almost entirely, and the perforation in the membrana closed. About this time there ensued a panophthalmitis on the left side, ending in phthisis bulbi. One year and a half later, this patient was treated for gangrene of the left foot, and suppuration in the bones of the leg of same side. In August, 1878, death occurred from cerebral apoplexy, two years after the mastoid operation, no traces of which were seen in the aural region, nor were there any aural symptoms at the time of patient's death. A post-mortem examination of the cranial cavity showed no marked changes over the temporal bone. During the aural disease the sugar in the urine amounted to 4 per cent.; when the gangrene of the foot set in—i. e., one year and a half after the ear disease—2 to 3 per cent.; and, subsequently, till death it was 0.

The most striking circumstance in connection with the case, and with those of Toynbee, Raynaud, and Kirchner, alluded to by the writer, is the suddenness of the otitis as well as the absence of any external exciting cause. Usually an acute otitis is referred by the patient to a general cold or to coryza; but

in these cases, referred to in the article under review, the attacks occurred in individuals carefully watched, in hospitals or their homes, on account of the diabetes.

It is furthermore of interest to note that, notwithstanding the most careful and suitable treatment, the inflammatory process invaded the mastoid portion, and then led to extensive destruction of osseous tissue. The latter symptom never occurs in an ordinary inflammation of the middle ear, unless there is, at the same time, some underlying constitutional taint. Raynaud is disposed to believe that the osteitis is the primary, and the tympanic disease the secondary lesion in these cases, and he refers the bone-disease to the diabetes, in the course of which osteitis is not uncommon. The latter, with anthrax and diffuse phlegmon, diseases tending to gangrene and necrosis of tissue, are to be considered as results of the so-called "inflammatory gangrenous diathesis" (Marchal de Colin) induced by the diabetes. It cannot, however, be shown that osteitis of the mastoid is the usual primary lesion in these cases of so-called diabetic otitis media. In fact, there is every probability that it is not.

The rapid passage of the inflammation from the tympanic cavity to the mastoid process is accounted for by the facts that, 1, in any case there is a ready sympathy between these two portions of the auditory apparatus, and, 2, the resistance of all parts of the body being diminished by the presence of diabetes, the mastoid portion readily yields to the encroachment of disease from the near tympanic cavity. But that an otitis media acuta can run its course favorably, entirely uninfluenced by diabetes already existing in the patient, is demonstrated by a case given in the same paper by Schwabach. If the mastoid is to be operated on at all in these cases, it must be done at the earliest indications.

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#### CEREBRAL DISEASES PRODUCED BY NON-TRAUMATIC LESIONS OF THE PETROUS BONE AND AUDITORY APPARATUS.

Under this title DR. ALBERT ROBIN has written a very interesting brochure. (Baillièrre et fils, Paris, 1883.) He has considered the development of brain diseases in their connection with pathological states of the ear, as they have been recorded in the literature of the subject, and his conclusions are of interest. After a short sketch of the development of the ear, the author sets forth the various ways in which a disease of the brain may result from an aural affection, viz., by direct communication through the thin bony partition, dividing the middle ear from the cerebral space, and also by means of the connection of the aural veins with the middle meningeal, which fact easily accounts for the vertigo, disturbed equilibrium, and involuntary movements. Those aural affections most productive of cerebral disease are the various inflammations of the middle ear, cholesteatoma, otitis externa and interna, the usually secondary tubercular otitis of the petrous bone, syphilitic ear diseases, and tumors of the aural cavities. The usual results are in the form of meningitis, meningo-encephalitis, hydrocephalus, abscesses, phlebitis of the sinuses and thrombosis, and apoplexy. It is also possible for several brain diseases to be present simultaneously in an individual case. In 200 cases taken from the literature of the subject, meningitis and abscess of the brain were coincident 55 times; meningitis and phlebitis, 28 times; meningitis,



phlebitis, and cerebral abscess, 20 times; meningitis and cerebellar abscess, 14 times; meningitis, cerebral abscess, and phlebitis, 9 times; cerebral abscess and phlebitis, 3 times; meningitis, cerebral and cerebellar abscess, with phlebitis, 1 time; phlebitis alone, 24 times; cerebral abscess alone, 22 times; meningo-encephalitis alone, 20 times; and cerebellar abscess, 4 times. Tuberculosis, scrofula, syphilis, and alcoholism, are considered eminently predisposing factors in the production of cerebral affections. The author also gives an interesting table of the ages of those affected by cerebral disease.

	Meningitis.	Cerebral abscess.	Cerebellar abscess.
5-10 years . . . . .	11	5	2
11-20 " . . . . .	48	27	7
21-30 " . . . . .	36	22	11
31-40 " . . . . .	18	7	5
41-50 " . . . . .	3	4	2
51-60 " . . . . .	2	4	1
Over 60 years . . . . .	4	4	—

Men are affected twice as often as women by consecutive aural diseases. The length of time elapsing between the occurrence of the ear disease and the affection of the brain, varies between one week and more than forty years. Clinically the author divides these consecutive brain diseases into the latent, by far the most frequent, the fulminant, and the rapid form.—Review by Dr. K. Bürkner, *Archiv f. Ohrenheilkunde*. Bd. 23, pp. 48, 49.

## DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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### FOREIGN BODY IN THE NASAL PASSAGES.

DR. WM. PORTER (*Journ. Amer. Med. Assoc.*, Sept. 26, 1885) reports a case in which the escape of an embryonic tooth into the nasal passages produced a chronic nasopharyngeal catarrh, which underwent cure soon after the spontaneous expulsion of the foreign body.

### AURAL DISEASE AS A SEQUEL TO NASAL AFFECTIONS.

DR. CHAS. H. BURNETT (*Med. News*, July 25, 1885) concludes that there is a constant causal relation between chronic nasal catarrh and chronic tympanic catarrh, and that this naso-aural disease is found under two forms—hypertrophic and atrophic. Treatment must be directed to the nasal passages. Incidentally, Dr. Burnett mentions two cases of acute otitis media excited by the use of the electric cautery in the nasal passages.

DR. BEVERLY ROBINSON devotes a special chapter in the new edition of



his treatise on *Nasal Catarrh and Allied Diseases*,<sup>1</sup> to "The Aural Complications of Nasal Disease."

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#### VASOMOTOR DISTURBANCES OF THE NASAL PASSAGES.

DR. WM. C. GLASGOW (*New York Med. Journ.*, August 8, 1885) describes three cases illustrating a condition which he at one time considered to be modified hay fever. It occurs, however, at all seasons of the year. The prominent features are great swelling of the cavernous tissue, profuse discharge of limpid fluid, and abnormal pallor of the mucous membrane. The latter condition, he thinks, points to increased constriction, rather than relaxation of the vessels.

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#### NASAL CHANCRE.

E. RASORI, of Rome (*Gaz. degli Ospitali*, No. 93, 1885; *Int. Centbl. f. Lar., Rhin.*, etc., November, 1885), describes an instance of hard chancre in the right nasal passage, but its exact seat is not indicated. Infection is attributed to digital transportation.

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#### TONSILLOTOMY.

M. DE ST. GERMAIN (*Phila. Med. Times*, Aug. 22, 1885) considers this simple operation not devoid of danger, and refuses to perform it if the tonsils do not touch in the median line. The subjects of enlarged tonsils are not any more liable than others to phthisis or diphtheria. In a child under two years of age, the loss of blood, however slight, may weaken the patient. From four years of age up to twelve is the period for operating. From seventeen to nineteen, and in adults, there is risk of hemorrhage, and the physician should remain with the patient at least an hour. During epidemics of diphtheria, operations are dangerous. A concave bistoury, the gland being held with a proper forceps, is considered by St. Germain preferable to the amygdalotome. The compiler has knowledge of a few recent cases of alarming hemorrhage following machine-tonsillotomy in adults. He considers the bistoury the best instrument for excision. When excision is for any reason to be avoided, the electric cautery furnishes a safe, even if tedious, method of reduction.

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#### CAFFEINE IN LARYNGEAL PHTHISIS.

DR. GOUGENHEIM (*Annales*, November, 1885) contributes an important paper, giving the result of his observations on caffeine as a substitute for cocaine in twelve cases. He employs a double salt of caffeine and sodium, the hydrochlorate of the former and the benzoate or salicylate of the latter, in order to produce a neutral solution. It was successful in oedema, less so in spasm, and inefficacious in a case of carcinoma. The relief to dysphagia was very prompt in all cases, but repeated applications were necessary. Even where cocaine had to be used at first, the effect could be maintained by caffeine. The use of caffeine, he thinks, will tend to diminish the abuse of cocaine.

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#### LATE TERTIARY SYPHILIS OF THE LARYNX.

DR. DELIE (*Bull. de la Soc. Franç.*, tome ii. f. ii.) supposed, when first called to treat Mademoiselle X., forty-seven years of age, that his patient

<sup>1</sup> New York, 1885; Wm. Wood & Co. See AMER. JOURN. MED. SCI., Oct. 1885, p. 493.

suffered with tuberculosis of the larynx. The absence of signs of pulmonary disease, and the rapid amelioration that took place under the local use of iodoform, dispelled that idea, and he finally obtained a history of a primary lesion at eighteen years of age. The patient, ignorant of the nature of the disease, and ashamed to confess her fault, had undergone no treatment.

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#### CHROMIC ACID IN THE NASAL FOSSÆ.

DR. M. BRESGEN, of Frankfort-on-Main (*Rev. Mensuelle*, October, 1885), gives his experience with this agent, which HERING's encomium induced him to employ. He embeds two or three crystals in a cotton wad attached to a silver probe, and places the mass in contact with the mucous membrane at any desired point. The mucus penetrates the cotton and dissolves the acid, which is thus limited in its application, the strength depending on the duration of the contact. Thus employed, he has secured breathing space in an occluded nose, after all other methods had failed. In cases of considerable enlargement, where the cold wire cannot be employed, the galvanocautery is more rapid and the wound longer in cicatrizing than that produced by chromic acid. The latter agent, he thinks, is superior to chromic acid, in all cases accessible to manipulation.

The danger of producing a perforation of the septum by the local employment of chromic acid (which accident the compiler has known to happen) must be borne in mind by all who use this drug in the nasal passages. With proper caution, it is, beyond question, a useful agent.

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## DERMATOLOGY.

UNDER THE CHARGE OF

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### ICHTHYOL.

LORENZ (*Deutsche med. Wochenschr.*, No. 36, 1885) describes ichthyol, a remedy which has found a place in cutaneous therapeutics. Ichthyol, or, more properly speaking, the salts of ichthyolsulphonic acid, is produced from a mineral oil rich in sulphur, which is obtained from a bituminous calcareous slate. The oil is perfectly translucent, of a brownish-yellow color, and sea-green fluorescence; has a specific gravity of 0.865, and boils between 100° and 225° C. The analysis gives: carbon, 77.25; hydrogen, 10.52; sulphur, 10.72; nitrogen, 1.10. The sulphur is intimately blended with the oil. By treating the oil with concentrated sulphuric acid, a considerable amount of sulphur

and oxygen is supplied, and ichthyolsulphonic acid is obtained. By this means a combination soluble in water and capable of being absorbed is formed, its solubility in water being an important feature from a therapeutic standpoint. Ichthyolsulphonic acid is of a greenish-black color, of syrupy, stringy consistence, with a peculiar sharp odor. Combinations of the acid with sodium, potassium, and ammonium have been obtained, the first two of which form brown, ropy pastes, the last named being more fluid. All three salts are perfectly and easily soluble in water. In diseases of the skin the author, recommends, as vehicles for the drug, water and equal parts of alcohol and ether, and also petroleum ointment.

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#### AN UNDESCRIBED DISEASE OF THE SKIN (GANGRENE WITH KELOID).

With this title DOUTRELEPONT (*Monatshefte für praktische Dermatologie*, November, 1885) gives the notes of a singular case. The disease occurred in a strong, buxom woman, twenty-five years of age, a nurse by occupation. On the first of August she stuck herself with a needle under the nail of the thumb. The needle, which gave rise to the formation of pus, was removed. The following day two whitish spots appeared on the first phalanx of the thumb. Gradually like lesions made their appearance over the whole body, accompanied with burning sensations. Some of them became pemphigoid blebs, beneath which, after the gangrenous epidermis had been cast off, a granulating growth manifested itself which passed into keloid. Later, under treatment with corrosive sublimate, the keloidal growth was arrested, the ulcers healing naturally. The lesions were non-symmetrical, and did not begin with erythema. The first impression made upon the observer was that the disease was keloid.

Doutrelepont remarks that such a wound occurring the day before the disease of the skin points strongly to an infection due to the inoculation of some virulent matter, but an examination into the subject gave negative results. Cocci were, as was to be expected, found upon the surface of the gangrenous skin. Some of the whitish patches were excised and hardened in alcohol, and sections showed here and there small aggregations of cocci, but they were more numerous on the surface. The case was regarded as unique.

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#### SPHACELINIC ACID IN ROSACEA.

UNNA, the well-known dermatologist of Hamburg, presents a preliminary note on this subject (*Monatshefte für praktische Dermatologie*, November, 1885). He was induced to experiment with it through the article of Kobert, entitled "On the Composition and Action of Ergot," this latter observer being the first to introduce sphacelinic acid, which he regards as the gangrene-producing agent of ergot. An extract rich in this acid, made up in the form of a five or ten per cent. ointment, gave very satisfactory results in *simple uncomplicated* rosacea. Where the disease was secondary to folliculitis, or to acne, the result was far less satisfactory. Moreover, the influence of this ointment in reducing hyperæmia was evident upon other concomitant angiectases, as in lupus, scars, and nævi. The action is painless.

Unna availed himself of the preparations of Gehe & Co., of Dresden, called "Extr. Sec. Cornuti cornutino-sphacelincum," and also of a very active extract containing sphacelinic acid, manufactured by Mielck, of Hamburg.

## A NEW VARIETY OF TUBERCULOSIS OF THE SKIN.

RIEHL (*Wiener med. Presse*, November 1, 1885, p. 1394) considers that up to the present date there are three forms of disease of the skin which must be designated tuberculosis. One of these is the miliary tuberculosis, with sub-acute course, first described by Jarisch, which is to be regarded as true tuberculosis. The two other forms of disease, which are known as scrofuloderma and lupus vulgaris, must also be viewed as tuberculous affections. To these varieties must now be added a fourth, which, according to Riehl, presents itself in the form of rounded, circumscribed, verrucous patches of variable size, localized (in the fifteen cases observed) upon the hands and the anterior third of the forearm, more especially upon the backs of the hands and the extensor surfaces of the fingers, upon one or upon both extremities.

The development of the patches takes place by an erythematous, bright red border forming around a former patch, upon which, in a few days, irregularly distributed minute pustules appear, the erythematous zone at the same time spreading: The pustules dry up, and after the crust has been detached show a slightly uneven brownish or violaceous red surface. In the course of weeks the elevations grow to club-shaped, and pointed papillomata, covered with extensive layers of epithelium. Small pustules still continue to form between the papillary growths, minute drops of pus exuding upon pressure, the whole patch at this period being crusted.

In the course of several weeks involution occurs, pus-formation ceasing entirely; the accumulations now consist chiefly of epithelial layers, and to such an extent as to resemble ichthyosis hystrix. The further retrogression takes place very slowly, the papillomata only after a period of months flattening, losing their horny covering, and being succeeded by superficial, smooth, knitted-looking scars, thus terminating the local process.

The patches, which make their appearance in indefinite number and at various points, increase in size with each relapse, and as the latter usually occurs about the periphery, the lesions assume the form of ragged borders. In large patches the central portion is always much scarred, so that annular and serpiginous tracts are formed. During the entire course of the disease, neither glandular swelling nor impairment of the general health was noted. In one case the disease had existed two years, in another fifteen years, so that the process must be regarded as a chronic one. The youngest patient was nineteen years, the oldest forty-five years of age.

The anatomical examination in seven different cases gave identical results. The bacteriological studies proved the anatomical diagnosis, tubercle bacilli in the giant and epitheloid cells, as well as in the granulation tissue, being found in all the cases examined.

Riehl proposes for the disease the name "tuberculosis verrucosa cutis." Treatment by means of caustics, excision, and erosion, together with iodoform dressings, gave favorable results.

[The disease depicted by Dr. Riehl seems to be one of the well-known varieties of scrofuloderma as described by Dr. Duhring in the third edition, p. 487, of his *Treatise on Diseases of the Skin*. Whether the manifestation should be regarded as being more appropriately classed under scrofuloderma or tuberculosis for the present must remain an open question.—EDS.]



## TREATMENT OF DISEASES OF THE SKIN WITH RESORCIN.

M. IHLE, in a practical paper (*Monatshefte für praktische Dermatologie*, Dec. 1885), reports favorable results in a number of cutaneous diseases with resorcin, which he was induced to experiment with from the good account given of this remedy by Dr. Andeer, in the *Monatshefte für prak. Derm.*, Jan. 1884. After referring to the antiseptic properties of resorcin and its value in the treatment of unclean wounds, ulcers, burns, lymphangitis, and lymphadenitis, and for the relief of pain in these affections, the result of its use in seventy-five cases of eczema is given. In acute eczema it cannot be commended, proving in most cases irritating; but in the chronic forms of the disease it worked beneficially in removing the eczematously thickened skin; after which, however, it was found that cure was more speedily accomplished by supplementing the treatment with other remedies, such as Wilkinson's ointment. The resorcin was employed in ointment form, the strength varying from five to fifty per cent.

In the parasitic diseases, tinea tonsurans and tinea sycosis, due to the trichophyton fungus, it acts promptly, and may be regarded as a specific. Fifty-three cases of sycosis and twenty-nine of tinea circinata barbæ were treated, in the greater number of which the presence of the parasite was proved. The specific anti-parasitic action of the remedy is particularly striking in the case of small patches, and in superficial, intact, annular lesions. Already, after two or three applications of a strong ointment, the inflammation subsides, it being necessary to continue the use of the remedy only where the disease has invaded hairy regions. A great advantage in the treatment of tinea sycosis with resorcin is that depilation is not necessary, the hairs being forced out of the follicles by the working in of the remedy. An ointment composed of the purest resorcin 10 parts, paraffine ointment 50 parts, oxide of zinc and starch each 25 parts, is recommended; a pure resorcin and white (not yellow) vaseline (the ungt. paraffini, Pharm. Germ.) being used to avoid a bluish coloration, which otherwise occurs. If the ten per cent. salve is well borne, the strength may soon be increased to twenty-five and later to fifty per cent. Shaving is interdicted during active treatment, the hairs being clipped every few days.

In the kindred diseases, tinea versicolor and so-called eczema marginatum, the same positive results were obtained as in tinea tonsurans and tinea sycosis. The author's experience with tinea favosa was limited, but in one case, that of a child, in which a five per cent. ointment was used, a cure was effected in two months. Good results were also obtained in seborrhœa, *cum defluvio capillorum*, with the following formula: resorcin, 5-10 parts; olei ricini, 45 parts; spirit. vini, 150 parts; bals. peruv., 0.5 part; to be rubbed in daily with a flannel rag. Not only did the fall of hair cease, but the itching was also abated. Cases are cited in which this remedy succeeded where other well-known preparations had failed.

The strong astringent, drying properties of resorcin render it moreover valuable in acuminated warts and in syphilitic flat condyloma. A fifty to eighty per cent. ointment, spread on a cloth and applied fresh daily to such growths, acts most happily. Even on the third day, the upper layers of epithelium become whitish, and begin to be cast off, leaving the growth beneath both smaller and flatter. The application of the ointment is to be repeated, and in

a short time the wart comes down to a level with the skin, when a weaker ointment may be substituted. In these cases, as well as in others where resorcin is used, it may here be mentioned that it is well to protect the surrounding healthy skin in order to prevent irritation. In psoriasis it was also found useful, and may be commended in those cases where chrysarobin and pyrogalllic acid are not tolerated. The author considers that no danger need be apprehended from cutaneous absorption. Internally it was not employed.

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#### RESORCIN IN THE TREATMENT OF EPITHELIOMA.

A case of epithelioma is reported (*Giornale internazionale delle scienze mediche*, 7, 1885, p. 575), by DR. RUBINO ANTONINO, in which a cure was brought about by application of resorcin. The epitheliomatous growth was situated on the side of the nose, being the size of a pea, with considerable surrounding hyperæmia and infiltration. The growth was washed twice daily with a solution of potassium permanganate, and resorcin in the proportion of fifteen parts to twenty of vaseline, kept applied in the intervals. The epitheliomatous tumor gradually disappeared, at the end of five months nothing being seen but an insignificant scar.

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#### CASE OF BULLOUS ERUPTION IN A CHILD.

A bullous eruption in a child of four years, following a few weeks after an attack of measles, is described (*Journ. Cutan. and Ven. Dis.*; November, 1885) by J. H. RIPLEY. It was preceded by an attack of urticaria, which had lasted, intermittently, a few weeks; and as it was apparently declining, circumscribed areas of dermatitis, variable as to size, appeared on different portions of the body, and developed into bullæ. The palms and scalp were not involved; new lesions continued to form from day to day. At first the contents were clear, later becoming turbid; and as the general condition became reduced, hemorrhage took place—the bullæ rupturing, and disclosing a bleeding surface. Hemorrhage also occurred from the nose, mouth, rectum, and beneath the finger- and toe-nails. The process was active for two weeks, recovery slowly taking place. The patient's general condition during the height of the disease was alarming, the temperature reaching 104° F. Sub-nitrate of bismuth was applied, and tonics and concentrated foods were given. With the exception of frequent attacks of urticaria in two (out of three) of the other children, and in the patient himself, nothing unusual was disclosed in the family history.

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#### THE ACTION OF UNNA'S PLASTER-MULLS.

In his observations (*Deutsche medicinische Wochenschrift*, December 17, 1885) L. HOFFMAN refers especially to the gutta-percha plasters. These have advantages over the salve-muslins (Salbenmulle); they are permanent, adhesive, comfortable, cleanly, and are more active.

The boric acid plaster proved of value in leg ulcers. A new plaster, large enough to cover the hardened border of the ulcer, was applied daily; later, after the surrounding parts had become somewhat softened, it was applied to the ulcer only. The ulcer became gradually smaller, the last part being

healed by a weak nitrate of silver ointment. Four cases are given, in all of which the result was favorable. In the treatment of bedsores this plaster also acted admirably.

Chrysarobin plaster (18 per cent. strength) gave excellent results in psoriasis. In its use there was no danger of the chrysarobin-conjunctivitis; and the erythema produced by the drug did not extend beyond the parts covered with the plaster.

In several cases of eczema in which the disease was dry and circumscribed, oxide of zinc plaster was employed and effected rapid cures. In the more severe forms the zinc and tar plaster was found efficacious. In obstinate cases naphthol plaster (ten per cent. strength) was tried with satisfactory effects. This last plaster proved useful also in a case of beginning lichen ruber.

Salicylic acid plasters are recommended for the treatment of infiltrated patches of eczema, also in verrucous and sclerous patches. This plaster also acts well in epidermal hypertrophies, as clavus and callositas. In clavus salicylic acid and mercury plaster is preferred on account of its being less painful. Salicylic acid plasters were found of value in the vegetable parasitic diseases, also in lupus and acne rosacea. The pain that the stronger salicylic acid plasters sooner or later give rise to, may be moderated by the use of those containing fifteen per cent. of extract of cannabis indica.

The mercury and carbolic acid plaster gave good results in furuncles. It acts differently according to the stage of the lesion. If applied in the beginning, the furuncle is aborted; if suppuration has set in, the same continues, but the process is painless. The frequency of renewal of fresh plaster depends upon the amount of suppuration. This plaster acts equally well in other phlegmonous inflammations.

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#### ETHEREAL SOLUTION OF CAOUTCHOUC.

This solution BIART (*Journ. Cutan. and Ven. Dis.*, December, 1885) prefers to the liquor gutta-perchæ, as the ether is less irritating than chloroform; and it is preferable to collodion as this latter is not so elastic. A quantity of the solution mixed with ointments and spread upon muslin, the writer states, makes a good adhesive dressing.

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#### ALOPECIA AREATA AND BACTERIUM DECALVANS.

SEHLEN has found (*Centralblatt für klinische Med.*, December 5, 1885) a micrococcus in the hair roots in alopecia areata. The writer succeeded in producing areas of baldness in animals by inoculations with the organism, a pure culture of which having been successfully obtained.

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#### THE TREATMENT OF CHILBLAINS.

According to MEURISSE (*Journal des Sciences Méd. de Lille*, November 20, 1885) chilblains may be relieved by local baths of sulphuric acid and water—a liquor-glass of the former to a quart of the latter. Ulceration is no contra-indication. The baths, lasting about ten minutes, are employed twice daily.

## THE LATER ADVANCES IN THE THERAPEUTICS OF SKIN DISEASES.

In a practical paper UNNA gives (*Medicinisch-Chirurgischer Centralblatt*, Wien, October 30, November 27, 1885) a *résumé* of the progress made in cutaneous therapeutics during later years. Among the various remedies brought forward, and which have apparently established claims to permanency, may be mentioned salicylic acid, the ichthyol preparations, calx sulphurata, resorcin, and cocaine.

Salicylic acid is especially valuable for its action in removing the normal or thickened horny layer, and for this purpose is best applied in the form of a plaster (salicylplastermull,<sup>1</sup> 5.0, 10.0, 20.0—50.0 gr. pro Rolle). Thickened, infiltrated patches of eczema, psoriasis patches, and lupus infiltration will yield much more readily to the ordinary remedies, if the corneous layer of the epidermis is first acted upon by a salicylic acid plaster. This remedy has the advantage of confining its action to the horny layer alone, and hence there is no danger of producing vesiculation or bullæ, as will sometimes happen when corrosive sublimate and similar drugs are employed. The action of the acid is not corrosive, but the "salicylated" corneous layer is usually cast off as a soft, whitish membrane. In addition to this action of salicylic acid, it sometimes has a favorable effect, if continuously applied, in reducing infiltration, such as lupus deposits, etc. An advantage which the drug also possesses is its compatibility with ordinary remedies, with the exception of alkalies and soaps.

The value of sulpho-ichthyol-ammonium lies in its high proportion of sulphur, its ready solubility in water, and its harmlessness. It has a favorable effect in pityriasis, seborrhœa sicca, ichthyosis, and also in the desquamation following acute exanthemata. In mild cases of psoriasis, also, its action is recognized. While the ordinary sulphur preparations must in eczema always be prescribed with caution, this compound may be added (in the proportion of about two per cent.) to the usual applications in this disease, always without fear of aggravating the disease, and almost invariably with good effect. The influence of the remedy, especially when given internally (for adults, fifteen grains daily; for children, three to seven grains), is seen in eczemas of nervous origin. The principal claim of the ichthyol salts, however, is their action, when applied locally, in acne and acne rosacea.

Calx sulphurata is valuable in interstitial suppuration, especially if given in the beginning. The dose varies from one-fifteenth to one-sixth of a grain, three or four times daily.

Resorcin has a recognized antiseptic value, and has proven useful in those diseases for which the ichthyol salts have been mentioned. Its lack of odor gives it some superiority over the latter preparations. It is not so harmless, however, and hence in universal and chronic skin diseases its use requires caution. It is especially valuable in those cases of eczema occurring about the eyelids, lips, and nasal orifices. It is applied as a ten to thirty per cent. salve or muslin plaster (Salbenmull).

Cocaine proves valuable in the form of a one per cent. solution or salve, in eczematous fissures of the anus and nipples; it should be applied frequently.

<sup>1</sup> Manufactured by Beiersdorff, an apothecary of Hamburg.



As regards the advance in the treatment of individual diseases, it may be said of lupus, that so far nothing has proven so useful as the curette, thoroughly employed, and followed by a caustic application. The diseased areas are to be scraped out, and then a caustic, such as nitrate of silver, chloride of zinc, etc., be carefully applied; or, better, the application of a concentrated solution of pyrogallic acid. Or pencilling the part with a pure ichthyol salt two or three times daily, may be employed. If more active cauterization is required, application of a ten to twenty per cent. pyrogallic acid salve may be used. For deeper cauterization muslin plasters of arsenic and mercury, pyrogallic acid, salicylic acid, salicylic acid and mercury, iodoform, salicylic acid and iodoform, iodide of lead, mercury, and carbolic acid. These plasters are applied to the scraped-out areas. If the curette is objected to, or for any other reason cannot be used, then the best method consists of the application of a strong salicylic acid plaster to act upon the horny layer of the epidermis, to be followed by one or more of the above-named plasters, until cure has taken place. Punctate and linear scarifications are not advised, for reason of the possibility of constitutional infection. The combined method of punctate scarification and injection of an antiseptic, however, is not, for known reasons, open to the same danger. Among the remedies which may be injected may be mentioned a fifty per cent. solution of ichthyol, with or without the addition of tincture of iodine; a ten per cent. solution of pyrogallic acid; a two to five per cent. solution of potash; and a five per cent. solution of creasote.

In regard to the treatment of furuncles, carbuncles, abscesses, etc., an experience of five years has taught the writer that early treatment will frequently abort the process; or at all events have a remarkably favorable influence. The remedy which gave these results is the mercury and carbolic acid muslin-plaster. The application, in addition to the favorable effects mentioned, has a marked influence on the pain. In those cases where pus collects beneath the plaster, the latter is removed, the pus allowed to dry, and the same or a new plaster applied. If convenient, a linseed poultice may be put on over the plaster. The practice of incising furuncles and carbuncles has, with rare exception, no advantages. On hairy regions, or where the plaster cannot be conveniently applied, the author recommends the application, twice daily, of a ten per cent. ichthyol salve. The best remedy for internal use in these affections is calx sulphurata, in doses of about a sixth of a grain, three times daily.

In erysipelas, applications of pyrogallic acid, resorcin, and the ichthyol salts are useful. They are applied in the form of ointments or plasters—the ichthyol salts, 20 to 50 per cent. strength; resorcin, 10 to 20 per cent.; pyrogallic acid, 5 per cent.

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#### PEMPHIGUS (CONTAGIOSA?).

A case of bullous disease (*Lancet*, January 16, 1886, p. 140) is reported by F. STURGES. The patient was a child seven days old, one of a family of six. The eruption appeared especially about the face, fingers, feet, and finally upon the thighs. The bullæ were tense; and, if ruptured, disclosed a surface appearing as a superficial burn. The general health was not affected. Under simple treatment complete recovery took place in between two and three

weeks. The affection also developed in four of the other children, and in the father and nurse, in all of whom, however, with one exception, the fingers were chiefly attacked. [The clinical features and course of the disease taken together lead to the conclusion that the cases described could be classified as examples of impetigo contagiosa.—REP.]

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#### REMARKS ON LICHEN PLANUS.

WEYL considers (*Deutsche med. Wochenschrift*, No. 36, 1885) the fact that lichen planus is met with on the glans penis, as well as upon the mucous membrane of the mouth, etc., as indicating the improbability of the disease holding any relationship to the hair-follicles or the sweat-glands. The first changes, as noted by the microscope, are hyperæmia and a downward extension of the rete. In consequence of this downward pressure the underlying papillæ are destroyed; the characteristic dell of the papule is thus produced. The white points which can be picked out of lichen patches are due to a local increase in the granular cells of the mucous layer; the color of the papules is due to venous hyperæmia. The itching of the disease is best controlled by an alcohol and glycerine solution ( $\frac{1}{2}$  per cent.) of naphthol.

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#### A CASE OF DYSIDROSIS OF THE FACE.

Under this title G. T. JACKSON (*Journ. Cutan. and Ven. Dis.*, January, 1886) reports a case of a cook, aged forty-three, in whom the face was the seat of vesicular lesions, appearing as large and small sago grains scattered over that region. The lesions varied in size from a pinhead to a small split-pea, showed no tendency to rupture, and presented a tolerably tough and thick covering. The affection had persisted for five years, being much more marked in summer weather.

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#### LANOLIN—A NEW OINTMENT BASE.

LIEBREICH (*Berl. klin. Wochenschrift*, 47, 1885) brings forward lanolin for an ointment base. It consists of a mixture of cholesterin fat (obtained from keratin-holding tissues, as sheep's wool, nails, etc.) and water. Pure cholesterin fat holds a middle position between a resin and a fat, but is capable of taking up its own bulk of water. This ointment base is neutral, easily absorbed, and is tolerably permanent. Its unctuous character may be better preserved by the addition of five or ten per cent. of ordinary fat or glycerine.

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#### SOME OF THE USES OF PYROGALLIC ACID IN DERMATOLOGY, AND THE DANGERS ATTENDING ITS APPLICATION.

The contribution of C. W. ALLEN (*Journ. Cutan. and Ven. Dis.*, January, 1886), under this caption, contains much of practical value. The author's experience with it in the treatment of lupus, although confessedly limited, has been satisfactory. It is especially valuable in those cases where the disease is returning in the cicatrix resulting from previous treatment, "seeking out" the individual nodules and leaving the healthy tissue and scar unchanged. It has the great advantage of being painless, or comparatively so. Several

cases of lupus vulgaris and one of lupus erythematosus, in which the remedy was used, are given in detail. In these cases the plans of application of the acid were as a powder, ointment, solution in collodion, or solution in liquor gutta-perchæ. The method of application by ointment for several days, to be followed by mercurial plaster, as recommended by Schwimmer, is favored.

In the treatment of chancroids the author prefers dusting the part with pure acid the first day, and the following day, after removing any crusts, painting on a solution (ten per cent.) in collodion. The application of the pure acid gives rise to momentary pain, but it is not severe. Healthy action is established in a few days, and the parts are subsequently treated with iodoform, black wash, or other dressing. In a case of tylosis of the feet, in which the ordinary methods of treatment had failed, application of a solution of pyrogallie acid in liquor gutta-perchæ, a drachm to the ounce, was followed by good results.

The dangers from the use of pyrogallie acid are both constitutional and local. The several cases of poisoning heretofore reported are quoted, and show that a single application to extensive surfaces has even a fatal effect, and, on the other hand, that poisonous symptoms are noted only after a more or less prolonged use of the drug. As a precaution, it is advisable not to apply the remedy over extended surfaces at a time, and that at first, especially in new cases, a mild ointment should be used. As to the unfavorable local effects on healthy skin, the literature furnishes nothing except passing reference to a dermatitis or erythema. It is generally supposed that the normal skin is not affected by the acid, and to a great extent this is true, but the contrary occurs, as the writer's experience shows, nor could the exceptional action be attributed to the acid used. Two illustrative cases (psoriasis) are given. In one a palm-sized patch on the thigh was treated with a ten per cent. ointment. For a week there was marked improvement, but a week later the tissues for an inch beyond the border of the patch were blackened and charred, and the surrounding skin much inflamed. A simple ointment was ordered, but an ulceration of the skin about the patch developed, and was slow in healing.

In the second case a ten per cent. ointment was applied for a week to a patch upon the leg, at the end of which time the patch became black and hardened, and the surrounding skin, for about an inch beyond, blistered. Soothing applications were made, under which, after the charred tissues had sloughed off, healing took place, leaving a disfiguring cicatrix. In several instances of lupus and epithelioma, strong applications destroyed cicatricial tissue. Occasionally, after the acid has been applied for a varying period, pain and inflammatory swelling are noted; in such cases its use should be intermitted.

In prescribing it with animal fats, the ointment should be freshly prepared at short intervals, as, owing to its deoxidizing property, such fats are readily decomposed, and then become irritating. In psoriasis good results were obtained by using collodion containing forty grains of the acid and ten drops of castor oil to the ounce. The author concludes "that its application is not without dangers, both to the general system and to the body's healthy surface," and "that it is capable of producing death in the one case and extensive sloughing in the other."



## A CASE OF MULTIPLE SARCOMA OF THE SKIN.

An example of this disease is reported by CHEEVER (*Boston Medical and Surgical Journal*, January 14, 1885). The patient was a female, aged sixty-five. The lesions began as pinkish nodules, freely movable on the deeper tissue, and were at first confined, without order or symmetry, to the extremities. Subsequently all parts of the body, except the head, were invaded. As the nodules increased in size, exfoliation, moderate in amount, of fine, silvery-white scales, was noted. Ulceration began on the surface of the lesion, at the centre, about the time they had attained the diameter of an inch; and under the crust, which was yellowish or greenish-brown in color, the ulceration progressed, at the same time the nodule grew laterally. The final resulting ulceration varied from one and a half to three inches across. The nodules were not sensitive or painful, and but few of the ulcers were attended with pain, and this was slight in character. The patient was nervous and depressed, but otherwise in good general health. Later the ulcers healed, except the smallest with the border of elevated new growth; this border of new growth in some lesions showed a tendency to disappear by absorption. A few months later new lesions were noticed, and the patient's health began to fail. About this time the case was seen by Dr. J. C. White, and Fowler's solution ordered. A number of the former nodules, however, had been absorbed, some in their entirety, others not completely, crescentic ridges being left. From one of these ridges on the right forearm grew a thick nodule, with a thin, red, exfoliating epidermis, and several small veins coursing over it. Later some of the tumors enlarged and fused together; so the process continued. The tumors and ulcers increased both in size and numbers. At the date of death, which took place from gradual loss of strength, eleven months from the beginning of the disease, there were about two hundred lesions, in various stages of development. Microscopic examination of the growth, which was made several weeks before death, showed it to be a small spindle-cell sarcoma.

## MIDWIFERY.

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 UNDER THE CHARGE OF

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 CONGENITAL LATERAL DEVIATIONS OF THE WOMB IN THEIR RELATION  
 TO CIRCUMUTERINE TUMORS AND THE MECHANISM OF DELIVERY.

Congenital lateral deviations of the uterus are so often met with, and so manifestly influence the development of various periuterine pathological conditions, and also the mechanism of parturition, that they deserve to be closely and attentively studied. PROFESSOR J. LAZAREWITCH, in an able article in the *Ann. de Gynec.*, July, 1885, p. 1, points out that, as a rule, the



womb is not placed exactly in the centre of the true pelvis, but is found more or less approximated to one of its walls. These congenital deviations depend usually on some congenital difference in the development of the uterine ligaments and of the vaginal wall—thus *the congenital retroposition of the uterus* depends on shortening of the sacrouterine ligaments. In this position of the womb we may easily have:

- (1) Anteversion and antelexion.
- (2) Location of tumors behind and above the body of the uterus.
- (3) During pregnancy and delivery, deviation of the cervix backward and upward, and saccular dilatation of the anterior wall of the lower uterine segment.
- (4) After confinement very marked anteversion and antelexion of the uterus.

*The congenital anteversion of the womb* depends on shortening of the anterior wall of the vagina. In this position there is a liability to:

- (1) Version and flexion of the womb backward.
- (2) The location of tumors in front of the uterus.
- (3) During pregnancy and delivery, deviation of the cervix forward and upward, and saccular dilatation of the posterior wall of the lower uterine segment.

*The congenital lateropositions, right or left, of the uterus*, depend either on want of development of the broad ligament, the ligament of the ovary, and the uterosacral ligament, or on want of development of the vaginal wall on the side on which the womb is most closely approximated to the pelvic wall. Lateroposition of the uterus tends to:

- (1) Lateroversion or lateroflexion of the organ.
- (2) The location of tumors behind or before the uterus.
- (3) Lateroversion of the uterus and unilateral saccular dilatation of the lower uterine segment during pregnancy and delivery.
- (4) Lateroversion of the womb after confinement.

Out of 1000 cases examined, the womb held the median position in 599, the left lateral in 359, and the right lateral in 42; M. Bernutz, out of 229 cases examined, found lateral deviations and lateral versions in 62. Lateral positions are either congenital, and in that case unchanging and constant, or acquired, in which case they are accidental and not permanent. We have said that these deviations are due either to shortening of the broad ligaments, or to want of length in the lateral part of the vaginal wall; in these latter cases the fornix of the vagina on the affected side is more shallow than on the opposite side, and the vaginal portion of the womb cannot be displaced from the lateral wall of the pelvis to which it is approximated, but in the former cases the vaginal fornix on the affected side is duly elevated, and the vaginal portion of the uterus may be drawn toward the median line of the pelvis whilst the fundus retains its abnormal position. Dr. Freund believes these congenital lateral deviations to depend on the position of the rectum; Kölliker has met with them in the autopsies of young infants.

According to gynecologists, lateropositions and lateroversions are of no importance, and are due to the displacement by tumors, pelvic inflammations, and such like causes; for his own part, Dr. Lazarewitch has noted frequent left lateral deviation in healthy virgins. He has observed deviation to persist

during pregnancy and after parturition, and has found preëxisting malpositions unaltered and unchanged, in spite of the presence and even after the disappearance of various tumors and effusions; if, however, the lateroposition is of pathological production, and not congenital, its persistence is by no means so constant. Tumors developing above the peritoneum of the pelvic cavity do not affect the congenital median or lateral positions of the womb, but sub-peritoneal growths are liable to displace the uterus.

The diagnosis of lateral deviation presents no difficulty, the height and width of the lateral vaginal arches should be compared, evidence of atrophy or undue fixity should be sought for in the vaginal roof on either side of the cervix, and the position of the cervix, as seen through a Cusco's speculum, should be carefully noted. In many cases of congenital lateroposition Dr. Lazarewitch has observed that on the side toward which deviation has taken place there is want of development in the breast, the nipple, and the areola, and that the same is often true of the labia minora and even majora; moreover, in several cases there has been imperfect development of the whole organism attended by chlorosis, dysmenorrhœa, flexion of the womb, and sterility. In lateral deviations a marked degree of version or flexion, forward or backward, is, owing to the proximity of the pelvic walls, improbable; when it occurs, the difficulty is best met by a pessary with a wide upper extremity, in preference to the oblique form suggested by Dr. Schultze. If the lateral deviation of the uterus is well marked, the utero-sacral ligaments assume an oblique direction, the rectovaginal cul-de-sac becomes distorted, and the ovary on the side from which the womb is displaced is liable to become prolapsed, while that on the side toward which the uterus has deviated is found displaced outward and upward. Under these circumstances the prolapsed ovary may become swollen, hypertrophied, tender, and accessible to touch *per vaginam*; to rectify this morbid condition, the patient ought to be kept in a position of lateral pronation with the pelvis slightly raised on a pillow.

If now we take into consideration this change in the position of the ovary, due to congenital lateral deviation of the womb, we can understand that cysts formed in these ovaries must have different relations with the uterus: it is, however, a false notion to suppose that an ovary, while undergoing cystic degeneration, displaces the uterus to the side opposite to that formerly occupied. The cyst which grows from the ovary belonging to the side where the periuterine space is the more extensive, possesses usually the longer pedicle; and, as a rule, the position of this cyst is behind the womb; on the contrary, the tumor which springs from the ovary belonging to the side on which the periuterine space is more limited, has a short pedicle, and in its growth leaves the uterus beneath it free. From the foregoing we are enabled to judge in most cases to which of the two ovaries the cyst belongs, and what is the length of its pedicle.

Hæmatoceles, pyoceles, and all the various tumors formed in the intra-peritoneal space, as well as cystic tumors, leave the position of the uterus exclusively dependent on the relative length of the two broad ligaments and the lateral walls of the vagina. Dr. Lazarewitch is convinced that if the tumor is developed even in the wall of the uterus, the latter keeps the same lateral position it had before the formation of the growth.

Congenital lateral deviation of the uterus in pregnancy may prove the cause

of various morbid conditions, and even favor abortion; moreover, in pregnant women the lateral position predisposes to lateral version, especially in multiparæ. Undoubtedly lateroversion as well as lateroposition exercises an unfavorable influence on the mechanism of parturition, and this influence is not always the same. In lateropositions the uterus preserves the normal direction of its axis, and its expulsive forces, acting in the direction of the pelvic axis, do not meet with opposing force from the lateral walls of the pelvis, but they do not act on the os, rather they are directed against one of the lateral walls, of the lower uterine segment, and this latter, yielding, assumes a saccular form. In lateroversions the gravid uterus preserves in its lower segment the regular form, but it changes the direction of its axis, and the expulsive forces, while acting equally on the two sides of the lower uterine segment, meet with resistance from one of the lateral walls of the pelvis. As a result of the above, one may easily understand that delayed dilatation of the cervix, irregularity in the pains, extreme exhaustion, and rupture of one of the lips of the external os are prone to arise in cases where lateropositions or lateroversions are present. In cases of lateroversion or lateroposition the labor should be carefully watched, and prompt recourse had to mechanical help, if need arise; lateroversion of the gravid uterus can be easily corrected by placing the woman on the side opposite to that one on which the fundus is lying, or, if she be confined on her back, by pushing up the uterus with one or both hands on the side toward which it is bent. When there is lateral deviation of the womb, change of position and pressure are not sufficient, but it is necessary to introduce the finger into the vagina, take hold of the edge of the os externum, and draw it toward the axis of the pelvis; dilatation, as a rule, soon follows. The fundus of the gravid uterus is often in a condition of lateral version when lateroposition of the cervix uteri exists from birth; in these cases it is not sufficient to correct the direction of the uterine axis, but the position of the mouth of the womb must be rectified also. Lateral deviations and lateroversions of the gravid uterus are in many cases so many causes of dystocia, and then simple mechanical manipulations afford evident relief. One interesting point may be noted, viz., that when the cervix is placed in an extreme degree of lateral deviation, the dilatation of the os may be transverse.

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#### ON THE RELATION OF THE AXIS OF THE UTERUS TO THAT OF THE PELVIC INLET.

KÜSTNER (*Zeitsch. f. Geb. u. Gyn.*, xi. p. 326) embodies the results of observations made to determine accurately the above relation. Until we discovered a method of ascertaining the direction of the plane of the pelvic inlet to within a few degrees, in addition to the direction of the uterine axis, we were obliged to be content with approximate estimates as to their relation. Now, owing to Schultze's ingenuity, we are able to measure the inclination of the pubo-spinous plane (that in which the iliac spines and the top of the symphysis lie), and from it obtain the plane of the inlet, since they are found on an average to form an angle of  $37^{\circ}$  with each other.

In order to obtain the relation which is indicated in the heading of this paper, the author proceeded as follows: The pregnant woman was placed close to a wall covered with a sheet of paper, and her profile (especially that of the



middle part of the body) carefully drawn. On this profile of the abdominal wall the highest spot reached by the uterus was marked, and also the upper edge of the symphysis. Moreover, the inclination of the pubo-spinous plane was measured in that posture in which the outline had been drawn. She was then laid on a horizontal table, the anterior profile drawn, and in it the highest point to which the uterus reached, and the upper limit of the symphysis were indicated. The position of the uterus, whether median or not, the presentation of the child, and the thickness of the abdominal walls were also noted.

To these outlines next was added the line of the pubo-spinous plane, and on making with it an angle of  $37^{\circ}$  the direction of the plane of the inlet was obtained. Thus, so far as relates to the uterus, we have in the drawing of the fundus the spot at which the anterior wall touched the symphysis and the convexity of the anterior uterine wall. Assuming (what is true within slight limits of error) that the posterior has a similar profile, we can complete the whole outline of the uterus. The axis of the latter was next added, and also that of the pelvic inlet, the angle at which these two lines intersect giving the required relation.

The two axes, when the woman is erect, are found either to coincide, or that of the uterus falls slightly behind the other, forming with it an angle of about  $8^{\circ}$ . This relation, however, varies with posture. When the woman is supine the pregnant uterus falls back, forming an angle which varies from a maximum of  $24^{\circ}$  to a minimum of  $0^{\circ}$ ; in the latter case the uterus had undergone a rotation to the right, taking up an oblique position, and causing not only no recession of the abdominal walls, but a slight projection. The average angle in the horizontal posture between the axis of the pelvic inlet and that of the uterus, which lies behind it, is probably about  $19^{\circ}$ . Various factors influence the degree in which the position of the uterus is altered; *e. g.*, pendulous abdomen.

One object in these investigations was to define the relation between the axis of the uterus and that of the plane of the pelvis, as far as they concern the position of the presenting part, especially the first stage in the mechanism of labor in cephalic presentations. Naegele's belief in the obliquity of the head was founded on the view that the axis of the uterus formed an angle with the axis of the plane of the uterus open toward the front. But as it is now shown that the condition upon which Naegele's obliquity depends does not exist for the generality of cases, the peculiarity in the position of the foetal head founded upon it may be dismissed.

The interesting question arises as to how far the relation of the axis of the uterus is connected with the various cranial positions. The result of Küstner's observations to determine this question shows that the cranial position does not directly and necessarily depend on the direction of the uterine axis; abnormal positions certainly do not so depend; and thus the whole basis upon which the teaching of Naegele's obliquity was founded—*viz.*, a false conception of the direction of the axis of the uterus—is destroyed.

CONCLUSIONS.—1. The axis of the uterus and that of the plane of the pelvic inlet in a well-made, erect woman, advanced in pregnancy, usually coincide.

2. Any deviation of the former takes place oftener backward than forward.



3. In a recumbent position, the uterine axis is usually behind that of the pelvic inlet.

4. The fact of the axis of the uterus being in front of, or behind that, of the pelvic inlet, provided the angle is but small, has no important influence over the main stages of the mechanism of labor.

5. Conclusions 1 and 2 destroy the foundation on which the existence of Naegele's obliquity is based.

6. As pregnant women usually occupy the dorsal position, No. 3 gives the usual relation of the axes.

7. Abnormal cranial presentations (such as those in which one or other parietal bone presents at the brim) are not necessarily and directly connected with the direction of the uterine axis.

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#### PERNICIOUS VOMITING OF PREGNANCY.

It has recently been shown that in normal pregnancy the great glands of the body, such as the liver and kidneys, undergo what is known by pathologists as cloudy swelling, changes which are almost identical with the first stage of the acute fatty degeneration of Bright's disease, and of acute yellow atrophy of the liver. Probably the natural or physiological vomiting of pregnancy has some causal relation with this altered state of nutrition. But if to this be added the influence of some exciting cause (concerning the precise nature of which, authors are not at present agreed), the change proceeds further and passes into acute fatty degeneration, with the production of eclampsia, or the pernicious vomiting of pregnancy, according as the brunt of the disease falls upon the kidneys or upon the liver. The following case, reported by DR. E. W. ROUGHTON (*Lancet*, September 5, 1885), illustrates many of the clinical features of this affection.

A primipara, æt. twenty, last menstruated at end of November. A month later she began to suffer from sickness; at first only in the morning, 8 A.M. till 11 A.M., but in January the sickness became more severe, commencing at 2 A.M. and lasting all the morning. She brought up everything she took. From February till she came under observation on April 16th, the vomiting was almost continuous. She was then much emaciated and looked very ill; her face wore an aspect of anxiety and gave evidence of great suffering, the conjunctivæ were slightly jaundiced, but hardly any bile-pigment could be recognized in the skin. She stated that her bowels were usually much constipated, but that she had sometimes noticed her motions to be loose and black. There were no physical signs of hepatic disease. Temperature normal; heart and lungs healthy; uterus presented normal characters of five months' gestation; urine contained trace of albumen and some bile-pigment, but no casts were discovered nor any evidence of the presence of leucin or tyrosin. She was ordered to be fed on iced milk and soda water, and to take an effervescing mixture of citrate of potash. On April 18th, she was much better, had only vomited twice, had kept down a considerable quantity of milk, and had slept fairly well; but at 6.30 P.M. her mental condition became suddenly changed, she commenced to shout at the top of her voice and to throw her arms about violently. This hysteroid attack lasted a few minutes and was followed by an interval of calm, during which she seemed quite confused, talked unintelligi-

bly, and would not answer when spoken to. Had a second attack ten minutes afterward exactly resembling the first. A draught of chloral and bromide of potassium was administered, after which she remained quiet and was rather more collected until midnight, when she had another similar attack, after which she remained in a semi-delirious state, but could be temporarily brought to consciousness. At 3 A.M. on April 19th it was determined to induce miscarriage, and a laminaria tent was introduced into the cervix. As she continued to show a tendency to be convulsed, she was kept partly under the influence of chloroform. Labor terminated naturally at 7.30 P.M. There was considerable post-partum hemorrhage, liquor amnii contained bile, and the fœtus was natural. Consciousness returned five or six hours after delivery, and she became quite rational. She made an uninterrupted recovery, but urine of low specific gravity was passed in large quantities, and remained bile-stained for four days after the miscarriage.

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#### POSITION DURING PARTURITION IN ANCIENT ROME.

DR. E. J. MILES, of Brighton, draws attention (*British Medical Journal*, Sept. 26, 1885) to the marble sarcophagi lately discovered at Rome, which, on the best authority, are considered to be the work of the third century A. D., or earlier. On the most beautiful one are depicted scenes representing the triumph of Bacchus. The left hand corner of the frieze is devoted to details connected with the birth of Bacchus. The scene represents the moment immediately following the birth of the infant god. The goddess-mother, Semele, is lying on her left side on a bed or couch, in an attitude of exhaustion, with her hands and arms hanging helplessly over the side of the couch, and immediately beneath them a basin of similar shape to the ordinary English ewer. Immediately behind is seen the accoucheur (a female), about to hand the newly born god to an attendant, and close at hand are the figures of other female attendants. Mercury stands close to the head of Semele's couch. All the interest of the bystanders appears to be concentrated in the babe, while the mother, as is, indeed, too often observed in the present day, is lying altogether unnoticed.

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#### UTERINE INERTIA DURING THE PERIOD OF EXPULSION IN PRIMIPARÆ; ITS CAUSES AND TREATMENT.

Uterine inertia during the period of expulsion in primiparæ is one of the commonest complications met with. It is often attributed to the exhaustion of the patient which prevents her bearing down any longer, but AHLFELD (*Deutsche med. Woch.*, Dec. 17, 1885) thinks that the inertia is much more often due to the fact that by the time the presenting part has approached the vulva, the uterus has undergone so much retraction, and has therefore lost so much of its expelling power, that it is unable to overcome even a small obstruction, such as that presented by the perineum and undilated vulvar fissure. Indeed at this stage of labor it is not rare for only a half, or even a third, of the child to lie in the contracting portion (owing to the retraction), which must therefore obviously work at a great disadvantage.

Ahlfeld has tried to demonstrate the small amount of energy retained by the uterus, by the time the fœtus has reached the perineum, by means of mano-

metric experiments carried out in cases of pelvic end presentations. As soon as the os uteri had fully dilated, he introduced into the anus of the fœtus a small India-rubber ball, pushing it up till it reached the sigmoid flexure. This ball was connected with a manometer and a recording drum. Ahlfeld, in one of his experiments, found that while the child was still within the os, the manometer indicated a pressure of 64 mm. (2.5 in.) during the interval between two pains; but as the presenting part advanced, the pressure upon it fell, and by the time the breech reached the perineum, had sunk to 29 mm. (1.2 in.). After this the force of the uterine contractions was practically nil, so that further progress depended entirely on the action of the abdominal muscles. The fall from 64 to 29 mm. (and from these should be subtracted 20 mm. or 0.8 inch, due to the elasticity of the ball itself) showed that the lower part of the fœtal body was exposed to quite an insignificant amount of pressure.

Ahlfeld believes that a part of the so-called uterine inertia in primiparæ is due to the limited agency of the abdominal muscles. These muscles in women generally will have a greater influence on the uterus the more they and the distended uterus bulge forward; and this bulging is admittedly less in primiparæ than in multi-paræ. Especially is it so in primiparæ with but a slight degree of pelvic inclination; indeed, in such women the abdominal muscles may scarcely present any convexity at all; consequently their effect on parturition will be almost nil. Of course other influences may also cause delay in the expulsive stage, but Ahlfeld makes the following suggestions for treatment in cases in which the above-mentioned causes are the active ones.

The first thing is to assist the abdominal muscles in acting vigorously, and this may be done by directing and encouraging the woman to fix her body and limbs in such a way as to enable the abdominal muscles to act as effectually as possible. Two other procedures may also be used: 1st, two fingers may be introduced into the dilated anus, with a view of pressing the head toward the outlet, especially during the intervals between the pains; 2d, a kind of improvised labor-stool may be employed. Such a one can be arranged by placing two chairs close to one another, so that one hind leg of one chair is in contact with that of the other, while the corresponding front legs are slightly separated. If the woman is seated on two such chairs with her thighs separated, the abdominal muscles will in most cases begin to act more energetically, and as soon as the head is seen to advance the woman may be carried back to bed.

In these cases of inertia most accoucheurs are only too ready to resort to the forceps, but if the above suggestions are adopted, it will often render the forceps superfluous, an end which it is desirable to attain whenever possible.

Some other phenomena connected with parturition can be satisfactorily explained by the peculiar relations which the uterus, when in large measure emptied, bears to the child during the last stage of its progress. For instance, the contracting uterus is sometimes so greatly diminished in size that the supply of oxygenated blood to the child is insufficient, and the latter dies from asphyxia. Nature indeed has done something to prevent this, by causing the area of placental insertion to contract much less than the rest of the uterus. But in spite of such provision, excessive retraction may cause the death of the fœtus. This is often the cause of death in those cases in which a child which had got as far as the perineum, and whose heart at that stage could be heard beating regularly, is born dead a quarter or half an hour later.



## OXYGEN IN ECLAMPSIA.

REIMANN, in *Centralbl. f. Gyn.*, December 5, 1885, summarizes five recently published cases of eclampsia in which the treatment by oxygen inhalations was adopted. Two out of the five died, while in one of those that recovered the oxygen was quite useless. In the other two cases of recovery, the eclampsia set in during the post-partum period, and it is always in such that the prognosis is most favorable. Reimann thinks the evidence justifies the opinion that oxygen is no better than the numerous other remedies that have been tried for this disease. It seems, however, to have a somewhat beneficial influence on the coma and on the respiratory affections, and may therefore be used as a palliative. Reimann thinks that most good may be expected from remedies which stimulate cutaneous activity, and has repeatedly seen good result from the cold pack.

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REMARKABLE CASE OF PELVIC DEFORMITY; RUPTURE OF UTERUS;  
CÆSAREAN SECTION.

DR. EUGENE DE SAINT MOULIN reports (*Journal d'Accouchements*, July 30, 1885, p. 161) a very interesting case, of which the following is an abstract:

Juliette D., at the age of sixteen, was struck on the lower part of the back by a large mass of stone, which knocked her down and literally crushed her. Removed to the hospital, she had to keep her bed three months, during which time she had involuntary evacuations of the bowels and incontinence of urine, preceded by retention. At the end of three months she had regained control over the bowels, but the incontinence of urine continued. At the end of six months she could walk with the help of crutches, and at the end of a year the incontinence was cured and locomotion was easier and more certain. On leaving the hospital there was still some deviation of the vertebral column, and her walk was halting; the patient before the accident had been quite free from any trace of rickets or osseous deformity.

Five years later, in 1877, she entered the lying-in department of Mons for her confinement; the following is the description of her pelvis as ascertained at that time: On making a vaginal examination the exploring finger impinges almost immediately on the promontory, which projects considerably into the cavity of the pelvis and is slightly deflected to the left. The pelvic cavity is deep, and a projecting crest arises from the internal surface of the symphysis pubis. Pelvic measurement gives for the antero-posterior diameter of the inlet three centimetres and six millimetres ( $1\frac{1}{2}$  inches), for the left sacrocotyloid diameter three centimetres ( $1\frac{1}{4}$  inches), and for the right sacrocotyloidean diameter four centimetres ( $1\frac{1}{2}$  inches). The pelvic contraction being so considerable, Dr. Pichuè decided to perform Cæsarean section, and met with complete success.

In January, 1884, Juliette D. entered the Maternity of Brussels; she stated herself to be seven months pregnant, and had felt fœtal movements for the last three months. Her age was twenty-eight, her height 55.3 inches. At the lower part of the back toward the base of the sacrum, in the point corresponding to the sacrovertebral angle, was a considerable hollow, which had a depth of  $1\frac{2}{3}$  inches; the curvature of the sacrum was abnormal, but the other parts of the skeleton were normal. The belly was pendulous, and



the uterus seemed to be developed in a sort of pouch, which projected in the fashion of a hernia outside the abdominal cavity, and hung in front of the thighs as low down as the knees. On raising the abdomen the skin was seen to be sloughing between the umbilicus and the pubis, and at this point fluctuation was perceptible. Next day, after having passed a bad night, the patient complained of severe abdominal pain, the features were pale and drawn, the pulse was 132 per minute, temperature  $37.5^{\circ}$  C. ( $99.5^{\circ}$  Fahr.), and respiration 40 per minute; the abdomen was distended, and the patient vomited everything ingested. The sufferer lay in a half somnolent condition, interrupted now and then by cries of pain and vomiting; any attempt to raise the belly caused pain, the extremities were cold and cyanosed, and the foetal heart-sounds no longer to be heard. At the lower part of the abdominal sac fluctuation was very distinct. Diagnosis being doubtful, it was decided to wait. On January 11th the symptoms of depression were less, and for the next few days the patient continued to improve slightly.

On January 16th, operation was decided upon, but without chloroform, as the patient's state seemed scarcely to justify its use. The abdominal wall having been incised in the middle line, the operator came at once upon a mass of numerous dark clots, which was removed with the hand; having cleared these out, the bag of the amnion became visible, protruding through a rent in the uterus. The diagnosis was at once clear: the uterus, weakened by the cicatrix left by the previous Cæsarean section, had given way at that point, and the resulting hemorrhage, limited by some old peritoneal adhesions, had become encysted and gradually ceased; the sac of the amnion had remained intact, but the foetus had succumbed. After having opened the bag of waters, Dr. Moulin enlarged the rent in the uterus, rapidly removed the foetus and placenta, and secured good uterine contraction. The lips of the uterine wound were brought together with catgut sutures, and the abdominal incision having been similarly secured, and a drainage tube inserted at its lower angle, the patient was put back to bed. The whole operation was conducted under strict Listerian precautions. For ten days all went well and there seemed a fair chance of recovery, but on January 26th epigastric pains set in, followed by extreme prostration; the pulse-rate rose to 144, general shivering and cold sweats followed, and in spite of every attempt at restoration she sank gradually into a state of syncope and died.

DESCRIPTION OF THE PELVIS.—At the first glance, one is struck by the marked projection in front of the vertebral column; this is so close to the symphysis pubis that it projects beyond the imaginary line of the transverse diameter of the inlet. The sacrum is doubled up; its anterior surface forms an acute angle, the apex of which is at the back and measures  $45^{\circ}$  degrees. The articular facet of the sacrum with the last lumbar vertebra looks directly forward, as does also the tip of the coccyx; these two points are only 4 centimetres (1.57 inches) apart. Looking from behind, one notices that the upper part of the sacrum and the lower part of the vertebral column are, as it were, sunk in. The incurving of the lumbar vertebræ is so marked that their spines, especially those of the second, third, and fourth, overlap each other, the sacroiliac ligaments are lengthened, and there is a gaping of the left sacroiliac articulation. The articular surface of the left wing of the sacrum is detached from the corresponding surface of the ilium,

while the transverse apophysis of the fifth lumbar vertebra is broken through. An osseous mass of new formation has consolidated these parts, but their mutual relations are completely modified; by the intervention of a voluminous mass of callus the sacrum and the fifth lumbar vertebra are soldered together on this side, and the sacroiliac articulation is ankylosed. The articular surface of the left lateral mass of the sacrum has sunk so as to make a projection of at least 2 centimetres (0.78 inch) into the great sciatic notch; as a consequence, the border of the left wing of the sacrum no longer assists in forming the innominate line, but its place is taken by the edge of the synostosis consequent on the fracture of the transverse apophysis of the fifth lumbar vertebra. On the right side the sacroiliac articulation has held firm, but the wing of the sacrum has been broken toward its middle part; the osseous union following has left this wing elongated, twisted, and slightly thickened.

The vertebral column has been displaced forward to such a degree that the last two lumbar vertebræ project into the pelvic cavity below the plane of the pelvic inlet. The brim of the pelvis, instead of being limited posteriorly by the promontory, is limited by the slightly projecting lower border of the third lumbar vertebra, and the distance between the centre of this border and the upper part of the symphysis pubis measures only 3.8 centimetres (1.49 inches), while curiously the distance between the lower part of the symphysis and the same part of the vertebral column equals 7.3 centimetres (2.87 inches). The lumbar part of the spine is slightly deflected to the left, thus the distance from the right iliopectineal eminence to the lower border of the third lumbar vertebra is 44 millimetres (1.73 inches), while on the left it is only 35 (1.37 inches). The lower border of the symphysis pubis is distant 11 centimetres (4.33 inches) from the sacrococcygeal articulation; the tuberosities of the ischia are 9 centimetres (3.54 inches) apart. Owing to the disturbed relations of the sacrum and iliac bones, the posterior and upper borders of the latter have become displaced backward, and, as a consequence, rupture of the symphysis pubis has occurred. The whole results of the tremendous injury done to the pelvis seem to have centred in the sacrum and fifth lumbar vertebra; the sacro-lumbar articulation has remained intact, but the second sacral vertebra is crushed, and has permitted the first sacral vertebra to slip down in front of it and become soldered by its lower border to the upper edge of the third sacral vertebra. The following measurements were obtained, viz.: Diameter of Baudelocque, 16 centimetres (5.29 inches); distance between the anterior and superior iliac spines, 23 centimetres (9.05 inches); distance between the posterior and superior iliac spines, 10 centimetres (3.93 inches); distance between the trochanters, 27 centimetres (10.62 inches).

Kilian, Herrgott, and recently Neugebauer, Jr., have described a variety of pelvic deformity in some respects resembling the one in question, and to their descriptions reference may profitably be made, but on examining the subject it is plain that the pelvis just described is neither the spondylolisthetic variety of Kilian nor the spondylizematic pelvis of Herrgott; there is in this case neither slipping of the vertebral column in front of the sacrum, nor caries, either of the body or of the vertebral arch. We have really to deal with a fracture of the sacrum complicated by left sacroiliac dislocation,

in consequence of which the vertebral column *en masse* has sunk down into the pelvic cavity. Under these circumstances we are justified in considering the present pelvic deformity as a special variety, to which we shall give the name of *pelvis obtecta*, adding, as the mode of origin, *due to fracture and dislocation of the sacrum*.

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#### PARTIAL INVERSION OF THE UTERUS DUE TO SHORTNESS OF THE CORD.

DYHRENFURTH relates such a case in the *Centralb. f. Gyn.*, Dec. 19, 1885. The patient was a Mrs. G., 5-para; four normal confinements. Dyhrenfurth, on being summoned to attend her, found that the liquor amnii had been discharged five days before; child in the second vertex position; fetal heart audible on the right side. The uterus was somewhat sensitive and firmly contracted round the fetus, the head of the latter lying above the brim of the pelvis. Vaginal examination showed that the cervical canal was not fully dilated; well-marked caput succedaneum. Dyhrenfurth gave some morphia, which caused the patient to sleep soundly. Twenty-four hours later strong pains came on, and Dyhrenfurth found the head low down in the pelvis, the lips of the os retracted, and a very large tense anterior fontanelle presenting; sutures wide, cranial bones very thin, showing a slight degree of hydrocephalus. Fœtal heart-sounds no longer audible; caput succedaneum flaccid. Dyhrenfurth perforated at the great fontanelle, and attempted to extract the head with the cranioclast; the cranial bones, however, were so thin and fragile that the cranioclast would not hold, and he was obliged to remove the whole vertex of the skull. Even then the head refused to descend, owing to the shoulders remaining above the pelvic brim; vigorous efforts, however, succeeded after a while in dragging the shoulders through the pelvis, when the remainder of the trunk followed without difficulty. Dyhrenfurth then sought to place his hand on the fundus uteri, but could not feel it, even on vigorously rubbing the abdominal walls. At the same time he noticed severe hemorrhage, and the nurse informed him that the umbilical cord was torn off. Dyhrenfurth at once introduced his disengaged hand into the vagina, and finding the placenta in the latter he removed it. Behind this, and within the external os, lay the partially inverted uterus, the placental area on the anterior wall. Dyhrenfurth replaced the fundus without any difficulty and injected several pints of cold water into the uterus, which soon became firmly contracted, when the hemorrhage ceased.

Inspection of the child and of the after-birth revealed the following remarkable facts: The cord was torn through obliquely at a point about 5 cm. (0.2 inch) from its insertion into the navel, while the portion adhering to the placenta was only 3 cm. long (1.2 inches); in other respects it was normal. The lying-in period passed off naturally, except for some bronchitis and considerable tenderness of the hypogastrium.

Dyhrenfurth believes that the shortness of the cord prevented the shoulders from descending into the pelvis, and that when he forcibly dragged them down, the placenta, which was still firmly adherent, inverted the uterus, causing the cord to tear through.

The funnel formed by the inversion could be distinctly felt during reposition. Dyhrenfurth also points out that the placenta was inserted on the anterior wall, and not on the fundus, while it is generally believed that it is



when the placenta is inserted into the fundus that traction on the cord is specially liable to produce inversion.

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IN CASES OF VERSION SHOULD THE FŒTUS BE IMMEDIATELY  
EXTRACTED?

WINTER discusses this question in the *Zeitsch. f. Geb. u. Gyn.*, 1886, p. 153. After pointing out the various procedures that have been in favor at different epochs, he expresses his conviction that in cases of uncomplicated transverse presentation, it is best to wait till the os uteri is fully dilated, than to turn and extract the fœtus at once. He disapproves of turning immediately that the case is diagnosed as a transverse one, because delay, in his experience, is not nearly so injurious as is generally believed. On the other hand, no interval should be allowed between version and artificial or spontaneous delivery, since such delay greatly damages the prognosis for the child. The above conclusions are based on the results of three hundred and ten cases of simple uncomplicated transverse presentations.

When a transverse presentation is diagnosed, the bag of membranes being still entire, it is admitted to be best for both mother and child to delay the version until the os is completely dilated.

Again, if the liquor amnii has been discharged before version, the latter should be at once performed if the cervix is completely dilated. Delay is useless.

But if the membranes burst just as the os is beginning to dilate the condition is a very serious one, and every aspect of the case should be considered before interfering. Winter, after carefully examining all the conditions, holds that there is no danger either to mother or child involved in waiting till the os dilates fully. The reason for which delay was formerly condemned was the fear—

1. That the fœtus would die in utero;
2. That delay would render version more difficult.

Both these events undoubtedly occur under some conditions, but Winter considers that they will not appear if the accoucheur merely waits till the os has dilated; that they occur only during the later stages of neglected transverse presentations.

When, in transverse presentations, the membranes rupture early, almost all the liquor amnii flows out, and the uterus becomes closely applied to the ovoid fetal mass (whether pains are present or not). This condition, however, does not interfere either with the placental or uterine circulation, nor does it cause compression of the umbilical cord, though so many statements to the contrary have been made. In Winter's series of cases, the membranes ruptured early in 203, and in 17 of them the child remained for from 6 to 18 hours in the uterus without any bad symptoms whatever. Moreover, Winter himself has seen 24 cases of early rupture of the membranes with contracted pelvis, in which the child remained between 1 and 96 hours in the uterus without any liquor amnii; in only one case did the child die *in utero*, after rupture of the membranes, without apparent cause.

It follows, therefore, that premature discharge of the liquor amnii in itself scarcely affects the child. There is, however, a condition secondary to it which may set in at any moment and prove rapidly fatal, viz., tympanites



uteri. As soon as air enters the uterus, the prognosis becomes bad for the child; out of ninety-four cases collected by Stande and Hofmeier, only six remained alive. The cause of the mortality is not quite clear, but it is very probable, as Preuschen suggests, that the premature admission of air excites respiratory movements which induce changes in the circulation, and lead to the death of the fœtus. The danger is, indeed, so great that the question arises whether the complication is so frequent and unavoidable that the dread of it is a sufficient reason for avoiding any delay after rupture. On this point Winter concludes that, though in many respects the conditions here referred to are favorable for the entrance of air, yet, if the lying-in woman be kept very quiet on her back, no unnecessary examinations being made, the complication will be extremely rare, so much so that it will not justify an interference which otherwise is undesirable. Indeed, in Winter's cases there were only four of uterine tympanites.

Winter next discusses the possibility of septic mischief setting in as a consequence of premature rupture of the membranes, and the usually coexisting inertia; but he saw it well marked in only 8 out of his 310 cases, and only in 5 of these did he attribute it to the prolonged labor.

This is so very small a proportion as not to justify an interference that is otherwise uncalled for, especially as the pyrexia has no effect on the child, and even the mother generally does well. Moreover, by means of antiseptics, most cases of pyrexia can be entirely prevented.

Inertia of the uterus in transverse presentations, with premature rupture of the membranes, is a source of danger to neither mother nor fœtus, though precautions should be taken to avoid uterine tympanites and septic pyrexia.

Should, however, strong pains come on after premature rupture of the membranes, there is a risk of the child dying *in utero* through the arrest of the placental circulation. Hence it is clear that as soon as the os has dilated the child should be turned and extracted, so as to remove it from its position of danger.

The question, however, arises, What is the influence of strong pains on the fœtus before dilatation of the os? Can they be fatal to the fœtus, or endanger it so much that it succumbs to version or extraction?

Winter replies that the pains under these conditions are not strong enough to kill the child; the fatal result which has so often been observed depends on the proper moment for interference (*i. e.*, the moment the os is fully dilated) having been missed.

Another danger to the life of the fœtus arises from tetanus uteri, which diminishes the supply of oxygen to the fœtus. Tetanus uteri, however, according to Winter, is a well-defined occurrence, which is always due to definite avoidable causes—*e. g.*, ergot, or unsuccessful attempts at version; and, if these causes are avoidable, tetanus uteri affords no argument for doing what is otherwise not good for the child. Winter concludes, therefore, that the fear of the fœtus dying while the os is becoming dilated is totally unfounded.

The impression that version was rendered more difficult through delay has had a yet stronger influence on the doctrine that early version is desirable. There are three distinct conditions by which it is alleged that the difficulty may be increased.

*a.* A state of passive uterine contraction in which the uterus is closely applied to the fœtus.

*b.* Tetanus uteri.

*c.* Delayed transverse presentation, with a deep impaction of the presenting part, and an associated cervical stretching tending to rupture of the uterus.

For these reasons it is argued that version should be performed as early as possible. Winter, however, considers that all three conditions come into operation, not if the dilatation of the os is merely waited for, but only when a case of transverse presentation is neglected beyond that period. As regards the first of them (*a*), so long as there are no pains, the fœtus may remain in the uterus without any injury, and the version is not made more difficult to any appreciable extent. If pains set in, they will rapidly cause dilatation of the os, and any tenseness of the uterine wall that may exist will be easily overcome if the patient is completely anesthetized.

Objection (*b*) relates to the so-called persistent spasmodic contraction of the uterus which occurs in neglected transverse presentations. Winter believes that, though a very dangerous complication, it will not occur under careful treatment—that is, during the period of dilatation. Its causes are excessive doses of ergot, or unsuccessful or severe obstetrical operations.

The third point (*c*) relates to the stretching of the “lower uterine segment,” and is of great importance.

Here, again, Winter considers that waiting till the os is fully dilated does no harm, and that any difficulties arising from the above are due to the right moment having been missed.

On all these grounds Winter concludes that in uncomplicated transverse presentations the right treatment is not to turn immediately on making the diagnosis, but only when the os has become fully dilated.

Winter next discusses the question whether the child should be extracted immediately after version. This course was naturally not possible so long as version was performed before the os was dilated. But granted that version should be postponed till dilatation has taken place, should extraction follow at once?

Winter expresses himself strongly against Zweifel's view that the placental respiration of the child is greatly endangered by the operation of version, and that it is best to allow it to recover before being exposed to the further risks of extraction. In Winter's 236 cases of version (with a dilated os) followed by immediate extraction, only 5 children were extracted dead; while out of 27 cases in which version was performed before the os was dilated, and in which either labor was allowed to go on naturally or in which extraction was done later, 13 children died.

The causes which make it dangerous to delay in extracting a child which has been turned, are the great risk which the cord runs of being compressed during version, and the not infrequent entrance of air during difficult versions. The latter event is dangerous both to mother and child—to mother, because it leads to septic mischief; to child, through exciting respiratory movements, with which are associated circulatory changes that often prove fatal. Most dangerous of all, however, is the detachment of the placenta which so often accompanies or follows version.

Winter sums up his results as follows:

(1) The doctrine that version and extraction should never be practised immediately, one after the other, arose from the false assumption that the prognosis in artificial foot presentations (produced by version) was as bad as in the ordinary ones.

(2) The formerly universal practice of turning as soon as possible after rupture of the membranes, was due to the dread of the foetus dying *in utero*, and of the version becoming more difficult if delayed.

(3) The foetus does not die in consequence of early rupture of the membranes, but only if tympanites uteri or extremely strong pains or tetanus uteri are superadded.

(4) Version is not rendered more difficult by waiting for the os to dilate, and in normal cases the child passes safely through the operations of turning and immediate extraction.

(5) Delay in extracting a child that has been turned is highly dangerous to it; some children die *in utero*; some may still be preserved if extraction is rapidly performed, even after some delay has occurred.

(6) Whether the membranes are ruptured or not, version must be deferred till extraction can follow immediately upon it; very distinct indications alone may call for a departure from this rule.

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#### ON EXPRESSION OF THE AFTER-COMING HEAD.

KOPPE, in the *Centralblatt für Gynäkologie* of Sept. 26, 1885, suggests a procedure somewhat different from that usually adopted for expressing the after-coming head in pelvic presentations. He points out that the pressure which is exerted on the head in a direction perpendicular to the pelvic inlet tends to flatten that part of it which is lying above the brim, and thus necessarily leads to an increase in all the diameters which run parallel to the brim. In other words, the usual mode of applying pressure causes an increase of the very part of the head (*i. e.*, the diameters which are parallel to the brim) which was already too large to pass through the pelvic cavity before the pressure was applied. This must necessitate the use of additional force to cause the head to pass, and cannot but be injurious both to mother and child. Koppe, to avoid the difficulty, and in order to diminish the diameter imparted in the conjugate, instead of increasing it (as occurs in the ordinary method), has adopted the following plan with good success:

After seeing that the bladder is empty, and making sure that the antero-posterior diameter of the head is lying pretty nearly in the transverse diameter of the pelvis (bringing it into that position if not there already), he gives the body of the child to the nurse, directing her to hold it according to the Prague method and in the proper position for the extraction. The accoucheur now approximates as much as possible the thenar and hypothenar eminences of one hand, places it immediately above the symphysis, and forcibly presses the projecting part of the foetal head against the last lumbar vertebra. In difficult cases he may support his elbow against his body in order to obtain greater power. After thus exerting a constant pressure for some seconds, the diameter of the head in which the pressure is applied becomes smaller, the bones gliding over one another at their sutures. In many cases



the compressed head gives a distinct sensation of yielding to the pressure. It is at this moment that expression or expression combined with traction on the trunk can be most favorably used for delivering the child. The free hand, usually the right, is placed flat over the vertex of the skull in the direction of its sagittal diameter, and strong pressure is applied in a direction perpendicular to the brim while the full lateral pressure is still kept up. At the same time the nurse should pull vigorously on the trunk. The head is now felt slowly to yield and to sink into the pelvic cavity, the accoucheur then seizes the body of the child in order to deliver the head as quickly as possible. In unusually difficult cases, an assistant may press upon the hand of the accoucheur so as to increase the pressure. One advantage of this procedure is that the compression of one diameter of the skull caused by it, is simply what occurs in normal labor. But what nature takes hours to do, is accomplished artificially in less than a minute. The diminution in the diameter of the skull corresponding to the c. v. must of course be accompanied by an elongation in the other diameters, but as the transverse diameter of the pelvis measures two cm. more than the c. v. this does not usually cause any difficulty.

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#### EXTRACTION OF AN AFTER-COMING HEAD.

The *Centralblatt f. Gyn.*, Nov. 7, 1885, contains a paper by FREUDENBERG, entitled "Extraction of an after-coming head," in which he admits the value of the method of expression recommended by Koppe, while maintaining in opposition to the latter, that when expression fails the forceps may be of great use. Koppe adduces two objections against the use of the forceps: 1. Its application involves a waste of time when every minute is important. Freudenberg replies that they can be applied in two minutes or not much more time than is consumed by the catheterization required before Koppe's method of expression can be practised; further, supposing that out of the twelve or thirteen minutes within which the head must be got through consistent with the life of the child, five are allowed for expression, there is abundance of time left for the forceps. 2. The forceps is applied in the transverse diameter of the pelvis, and by compressing the diameter of the head in which the blades lie, causes an increase in all the other diameters. Freudenberg admits that in principle this is true, but points out that as a matter of fact the forceps exert far more traction than compression, as is shown by the frequency with which the head rotates, while still within the forceps, without the latter rotating. Hence this argument of Koppe's is insufficient to cause a rejection of the forceps.

Freudenberg grants that Koppe's modification of the expression method may be of some value, though actual experience must settle the degree of utility. His method, however, is only available when the sagittal diameter runs transversely in the pelvis, and even in these cases it is questionable whether the usual means (traction from below, force of pains) do not exert as much compression as is safe.

When the head lies other than transversely Koppe's procedure is unavailable, but the forceps may be of great service in rectifying such malposition. Further, there are cases in which expression does not succeed in delivering. In such we have to decide, not between forceps and expression, but between



forceps and perforation. Koppe has therefore gone too far in rejecting the forceps entirely in the delivery of an after-coming head.

#### THE APPLICATION OF THE FORCEPS TO AN AFTER-COMING HEAD.

LOMER, in *Zeitschr. f. Geb. u. Gyn.*, 1886, p. 111, contributes an article on the above subject. After briefly summarizing the two rival views, 1st, that maintained by Schröder, who holds that it is a useless procedure to apply the forceps to an after-coming head, and 2d, that of Credé, who argues that the application of the forceps in such conditions may sometimes be useful, he declares his conviction, based on an experience of three cases, that Credé's view is the true one. Indeed, Lomer believes that in every one of his three cases the forceps was the means of saving the life of the child. On one occasion he attended a multipara in whom he found the second vertex position, with prolapse of the left hand and arm. The liquor amnii had been discharged three hours before; os fully dilated. Lomer performed version and extraction, the latter succeeding readily till the head was reached. Child was a very large one. Lomer as well as his assistant pulled hard, one at the shoulder the other at the lower jaw, but without being able to deliver the head. Abdominal expression was also tried and failed. Lomer thought the child was dead, and applied the forceps. With its help the head could be felt to yield, and on being extracted was found to be above the average size. After a good deal of trouble the child was brought back to life.

Lomer admits that such cases must be exceptional, and in a great many perforation will be the only wise procedure; on the other hand, in ordinary cases extraction by manipulation will readily succeed and be the best procedure. Nevertheless the forceps is of value in some cases of an after-coming head, and must not be entirely discarded.

#### WHEN SHOULD THE UMBILICAL CORD BE TIED?

ENGEL (*Centralbl. f. Gyn.*, November 14, 1885), after introductory remarks as to previous observations, describes some investigations of his own made with a view of settling the above question. He followed Schücking's procedure—*i. e.*, weighed the child twice; first immediately after delivery, and again when the cord had ceased to pulsate and become pale and collapsed. The latter point is important, inasmuch as the vein continues to transmit blood (to the extent of about 10 grammes) after pulsation in the arteries has ceased. Engel weighed 60 children in this way, 24 being premature. The greatest increase in weight shown by the second weighing amounted to 70 grammes in a child at the full time, in a premature child to 90. In the latter he found the pulsation generally lasted longer. It follows from this that the child gets more blood when the cord is ligatured late.

Engel next deals with the questions, What is the cause of this physiological transfusion, and what is its value to the child? As regards the first question there is difference of opinion, some ascribe it to thoracic aspiration, others to the force of the uterine contractions during the third stage of labor. There are several reasons against aspiration being the only cause. 1. A more or less considerable increase in weight may take place before the child begins to breathe—*i. e.*, while aspiration is still inactive. 2. If aspiration were the

cause of the transfusion, the latter would be slight during the first minutes before respiration is fully established and increased afterward, whereas the exact opposite is found to be the case.

That the uterine contractions are not active in producing the transfusion is shown by the fact that such transfusion is greatest immediately after the expulsion of the child—*i. e.*, at a time when the uterus is quiescent and uncontracted and the placenta not compressed.

It is natural to suppose that the cause of the circulation through the cord is the same after the birth of the child as during its intrauterine life—*i. e.*, cardiac activity. Thus in cases of severe asphyxia, in which the heart's action is very feeble, the cord does not pulsate and no circulation though it takes place. In healthy children, however, the heart pumps the blood to the placenta and allows its return through the vein. It is, however, not the cardiac activity which causes the increased supply of blood to the child. Here the agent is the greater contractility of the arteries by which the blood is squeezed onward owing to their contracting before the vein, the latter also remains patent longest.

The quantity of blood which the newborn child gains when the cord is tied late, and which amounts to from one-fourth to one-third of the whole of its blood, must have a physiological meaning; and seeing how sensitive newborn children are to the loss of even small quantities of blood—*e. g.*, during circumcision, etc.—early or late ligaturing must be expected to have an important influence. Such an influence is seen in the more rosy color of the skin and the quieter demeanor where late ligaturing is practised; such children look more mature, begin to suck later, cry less, and sleep more. Icterus infantum also is rarer.

As regards the decrease in the weight of the infant, which usually occurs after normal labor, Engel could not show any connection between early or late ligaturing and such decrease. Late ligaturing of the cord had, however, in his experience, an important influence over the mortality of newborn, and especially of premature children. In his Maternity, during four years in which early ligaturing was the custom, 90 premature children were born (measuring 44-47 cm. in length); 18.88 per cent. died within ten days.

During the next four years in which the cord was not ligatured till it had ceased to pulsate, 74 premature children were born, of which 9.45 per cent. died within ten days.

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#### HOW SHOULD A DOCTOR CLEANSE HIS HANDS?

The *Centralb. f. klin. Med.*, 1885, No. 18, contains a paper by FORSTER (Amsterdam) on the above subject. The author directed his pupils to investigate by experimental methods what was the best method of sterilizing their hands to which, of course, under ordinary circumstances, more or less bacteria-containing dust would be adherent. Every possible disinfectant was subjected to trial, and in the following way: A single finger was first thoroughly cleansed in the disinfectant under trial, and then dipped in a sterilized neutral or feebly alkaline peptonized meat infusion. With every disinfectant except one, after from twenty-four to sixty hours, some form or other of schizomycetes appeared, which was then examined both in regard to

its naked-eye characters and also microscopically. Washing with 2.5 per cent. carbolic acid was not sufficient to sterilize the hands; nothing but a solution of corrosive sublimate—0.5 and 1:1000—succeeded in sterilizing them so completely that no cultivations of bacteria could be obtained from them, even when the most sensitive nutrient medium was employed.

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PUERPERAL ENDOCARDITIS, WITH HEMIPLEGIA, AFTER DELIVERY.

Under the above heading, DR. WM. C. NEVILLE instances (*Dublin Journ. Med. Sci.*, Aug. 1885, p. 112) the case of a 7-para attended by left hemiplegia on the morning after delivery. As the patient was sitting up in bed she suddenly felt giddy, fell back, and was convulsed. The convulsions were of a transitory character. There was complete loss of motion on the left side, with transient rigidity and almost complete anæsthesia; some slight reflex movements, however, could be obtained. The left side of the face was paralyzed, and head and eyes turned toward right side. Left pupil dilated, but both responded to light. Right limbs, which for a day or two at the outset were subject to frequent choreiform movements, could be moved at will, and attained sensibility. It was possible to rouse patient from state of partial insensibility, but though capable of uttering certain words, she was at first quite unable to give any articulate reply to questions which she apparently understood. In a few hours the aphasia passed off, and she complained of severe pain in the left side of the head, and a few days afterwards of constant pains in the left ankle and up the left leg. Bladder emptied itself naturally; urine not albuminous, no casts. Temperature, normal at first, rose to 101.4° F. on evening of eighth day, and patient continued slightly feverish till death occurred on evening of sixteenth day after delivery. Respiration, slow and labored at first, became hurried toward end. Pulse, weak and irregular for first few days, became weaker and more frequent subsequently. On the fourth day after delivery it was noted that the heart was acting irregularly at times; the aortic sounds were both indistinct, and faint aortic regurgitant and obstructive murmurs were heard. Second sound louder over pulmonary artery. Radial pulse visible and jerky, especially so on the right side. Patient died semi-comatose, with lividity of face and extremities, heart's action for six hours previously having been very irregular and weak, and severe angina-like pains complained of. No sign of pelvic mischief throughout, and patient continued to suckle child till supply of milk diminished on the occurrence of a rise of temperature.

Autopsy revealed slight excess of pericardial fluid. Large heart, thickly coated with fat, right side dilated, and substance somewhat pale; left ventricle hypertrophied and of better color. Clots, probably ante-mortem, in both auricles, another in left ventricle, more characteristically ante-mortem. Aortic valve incompetent and slightly atheromatous, one presenting a small conical vegetation, with vascular and abraded apex, evidently of recent origin. Other valves healthy. On opening dura mater considerable amount of semi-turbid fluid found upon both sides, more especially beneath arachnoid. Right carotid occluded by embolus, extending some distance along middle cerebral artery. Right middle lobe of brain much softened. Slight amount of purulent-looking fluid in right lateral ventricle. Optic thalamus and corpus



striatum soft and pulpy upon right side, markedly contrasting with the healthy condition of these bodies on opposite side. Uterus well involuted. Other organs presented no morbid characters worthy of note.

This patient had never suffered from rheumatic fever, nor from any of the more usual causes of heart trouble, nor complained of any symptoms specially referable to the heart during pregnancy. She is stated to have suffered from some form of eclamptic attack, attended with insensibility, a few days after the birth of her last child, but recovered perfectly.

In commenting upon this case, Dr. Neville remarks that the altered condition of the blood and vascular system generally of the pregnant woman tends, not only toward the intensification of chronic endocarditis, but also to the production of endocardial inflammation *de novo*, either with or without preëxisting pyæmic lesions, and often of a malignant type. In this way, he suggests that some of those rare examples of the so-called "puerperal fever" arising during the last weeks of pregnancy, without any recognizable means of hetero-septis, may be accounted for—that they may really have been cases of this quickly fatal form of septic endocarditis.

Moreover, he points out that this affection is especially liable to occur in patients whose nervous systems are for some reason depressed, and it is also possible that in this may be found the well-known predisposition of unmarried primiparæ to suffer from the various kinds of septic diseases of childbed.

In many of the cases of embolic hemiplegia previously recorded, and verified by post-mortem examination, the lesion appears to have arisen in consequence of the ulcerative form of endocarditis. In the case, however, now recorded, the history and the post-mortem appearances prove, with sufficient clearness, that the embolus arose in consequence of an acute or subacute endocarditis, originating during the latter months of pregnancy, and affecting one only, and that an aortic valve. The aortic lesion certainly appeared to be quite recent in origin, though for a year previous to her confinement the patient had suffered unusual hardships and privation—of itself a sufficient cause of endocarditis, apart altogether from pregnancy, or any of its more generally recognized causes. That the hemiplegia was due to organic lesion of the brain, the result of embolism, is sufficiently proved by the post-mortem examination; and it is probable that many of those cases of paralysis during pregnancy and the puerperal state, formerly referred to hysteria, direct pressure on pelvic nerves, albuminuria, apoplexies, and various other hypotheses, may have been due to a similar cause. Death seems to have resulted from failure of the fatty heart to carry on the circulation, and from the largeness of the cerebral area in which nutrition was suddenly arrested.

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#### THE GLYCOSURIA OF LACTATION.

As the result of a series of observations, DR. SINCLAIR (*The Medical Chronicle*, January, 1886, p. 276) regards the glycosuria of lactation ("galactosuria") as a physiological phenomenon due to the resorption of milk in engorged breasts. The milk-sugar, possibly in a slightly altered form, is excreted by the kidneys.

When to such urine yeast is added, fermentation does not occur except to a very limited extent, unless the specimen has been previously boiled with sulphuric acid.



With Fehling's solution reduction takes place, sometimes immediately, sometimes after a considerable interval. Moreover, the amount and character of the precipitate is subject to considerable variation. Sometimes there may be observed a peculiar play of color, a sort of opalescence, an absence of precipitation or filtrability, and other peculiarities which have not so far been explained and are not referable to the reducing power of simple milk-sugar. On these grounds the presence, in addition to the milk-sugar, of some saccharine substance either free or in some combination, appears probable.

After the first engorgement of the breasts the amount of sugar, as indicated by Fehling's test, varies unaccountably, and sometimes it continues to show its presence intermittently for a long time.

These sugar-containing urines vary in specific gravity up to 1.037. Urines of specific gravity below 1.020 reduce the Fehling's solution only after boiling for some minutes. The amount of solid matter and of urea is found to be relatively increased in the samples in which sugar is present. The increase in the organic matter is not accounted for by the amount of urea, but it seems probable that even if the casein and fat of the milk do not appear unchanged in the urine, yet their equivalents may be excreted in some form. They may in future correct analysis be found among the constituents of urine.

What practical bearing galactosuria may have on the healing of wounds is a point for further observation.

Dr. Sinclair considers that the milk drawn by an infant from overdistended breasts, being deprived by partial resorption of sugar and salts, and doubtless also a portion of the water, is too rich in casein and butter, and is in consequence apt to disagree.

The observations would have been more valuable if they had been contrasted with others in which the flow of milk was diminished or arrested without engorgement of the breasts. It has been noted that sugar has appeared in the urine under these circumstances, irrespectively of engorgement.

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## GYNECOLOGY.

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### MALIGNANT DISEASES OF THE OVARY.

The *Zeitschrift f. Geb. u. Gyn.*, 1885, p. 14, contains a paper by COHN on this subject, viewed from a clinical standpoint. In it he compares the success hitherto obtained in operations performed for these diseases with that of 100 cases treated in the gynecological department of the University Hospital at Berlin. Till recently, the best ovariologists have stated that almost every woman affected by the above disease who was operated on, died soon after the operation. This opinion, together with the faint prospect of prolonging life, even if recovery did happily occur, caused all interference to be deprecated as much as possible.

Quite lately, however, some operators have advised that even malignant neoplasms of the ovaries, if diagnosed, be removed, supporting their opinion by cases in which the operation added years of health to the life of the woman.

The question as to the desirability of operating involves many considerations—*e. g.*, Is there a prospect of removing the whole growth? What progress is the latter making? When should the operation be performed?

Cohn's remarks are based on 100 cases of malignant tumors of the ovaries in which laparotomy was performed; 86 of these operations were completed; in 14 nothing more than exploratory incisions were made. He divides malignant diseases of the ovaries into solid tumors, *viz.*, sarcomata and carcinomata; and into tumors which have more or less fluid contents—*viz.*, cystomata which have undergone cancerous degeneration, papillary cystomata, and finally those which are partly glandular, partly dermoid, with coexisting malignant degeneration.

The possibility of more or less permanent recovery taking place after removal of malignant growths of the ovaries has hitherto received but scanty attention from writers on gynecology, and it is most desirable to settle the question whether the results of ovariectomy in malignant ovarian new formations are really as bad as seems to be generally believed.

Diagnosis is very important, though difficult from a want of definite signs. Sarcoma of the ovary is perhaps the most difficult growth to diagnose; it forms a solid tumor which has usually a flat surface showing here and there traces of previous peritonitic irritation; with sarcomata are generally associated menstrual irregularities and extreme anæmia.

Ovarian carcinoma presents rather more characteristic signs. It should always be suspected when a solid ovarian tumor is found, which, while still of moderate size, causes ascites and anasarca of the limbs (without coexisting cardiac, pulmonary, or renal disease) and an emaciation which begins slowly and then progresses rapidly.

The diagnosis of cysts that have undergone cancerous degeneration (except papillary cysts) mainly depends on the following points. A cyst is discovered which suddenly begins to increase rapidly, leading to ascites, to œdema of the lower limbs, and to deterioration of the general health; in favorable cases, direct palpation of the indurated nodules in the walls of the tumor is possible. Papillary cysts are divided by Cohn into two classes: (1) those in which the papillæ are confined to the inner surface of the cyst, and (2) those in which they have reached the outer surface. The first group can sometimes be diagnosed by tapping, if the operation is very successful and yields histological elements derived from the villi. The second group is more easy to diagnose, for as soon as the papillæ reach the surface of the cyst they involve the adjacent peritoneum, and when this has occurred the characteristic irregular masses of varying consistence can be felt on the surface, both of the cyst and of the peritoneum (best in Douglas's pouch), especially on bimanual exploration.

Examination of the ascitic fluid which is always present is still of doubtful utility, some authors considering the presence of certain groups of cells as proof of the malignant nature of the growth, while others deny such significance. A blood-stained peritoneal fluid associated with an ovarian growth is,

however, a very common occurrence with papillary degeneration. Moreover, in the latter, both ovaries are very commonly diseased.

As regards tapping for the sake of diagnosis, Cohn considers it a bad practice in most cases, though allowable where there is great obscurity and difficulty—as, for instance, where it cannot otherwise be ascertained whether the tumor is ovarian or not. If, however, the diagnosis is merely a question of malignancy or non-malignancy, tapping is to be discountenanced, since malignant growths often spread with greater rapidity after it.

Exploratory incisions are often necessary to settle the question whether the growth can be removed or not.

Cohn next discusses the wisdom of operating in malignant diseases of the ovaries, and entirely dissents from the view generally taken, namely, that the prognosis in such cases operated on is practically hopeless.

This, indeed, has been almost universally taught, though of late the prognosis for sarcoma has been admitted to be somewhat better. From a study of his series of cases, he thinks that if the tumor is more or less freely movable, the retroperitoneal glands not too extensively affected, and no very large malignant deposits can be felt on the peritoneum—if, in short, the operation presents no especial difficulties, the only objection to it is the fear of a rapid return of the disease.

Cohn then gives the results in the 100 cases above referred to:

86 completed operations—

(1) 10 cases of sarcomata were operated on: 5 recovered; 3 died from operation: in 2 the disease returned (once 1, once 2 years afterward) and proved fatal.

(2) 11 cases of carcinomata were operated on: 4 died from the operation; in 3 the disease returned and caused death; 4 cases recovered.

(3) 14 cases of proliferous cystic glandular carcinomata: 2 died from the operation; 4 died from a return of the disease; 5 recovered and were lost sight of; 2 more recovered and were well 3 years; another was well 8 months after the operation; in yet another, the growth returned and the operation was repeated, the patient being well 8 months after second operation.

(4) Mixed tumors. *a.* 1 dermoid sarcoma—recovery, good health 4½ years. *b.* dermoid carcinomata: 2 cases; in 1 the disease recurred 8 months later; the other recovered and was in good health 6 months after operation.

(5) Myxomata. 3 cases were operated on: 2 died 3 days after operation; 1 recovered and was well 5 months after operation.

(6) Proliferous papillary cysts. *a.* Innocent (by these, Cohn means those which either were not microscopically examined, or those in which the cancerous nature was not clear)—22 cases operated on: 2 died from operation; 20 recovered. *b.* Malignant—14 operations: 2 died from operation; 4 from a recurrence of the disease; the rest recovered. *c.* Suspected of malignancy, 8 cases: 1 died; 7 recovered.

Exploratory incisions—14 cases: 3 died from operation (1 papillary tumor, 1 myxoma, 1 carcinoma); 11 recovered.

Only 20 per cent of the whole number of patients operated on died from the operation, which, Cohn points out, is a much smaller proportion than that shown by previous statistics. As regards the liability to recurrence, the sar-

comata showed least, the papillary growths most, tendency to recur. Taking the 86 cases of completed operations, and estimating the number of women under observation for at least one year, and in whom during that period no recurrence took place, as many were completely cured as died from the operation.

Cohn concludes from his researches that when an ovarian tumor is discovered which can be diagnosed as being other than a mere hydrops folliculi or a parovarian cyst, if there is reason to think that it is a proliferous tumor, and especially if it affects both ovaries, immediate ovariectomy is indicated.

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#### NOTES ON PAROVARIAN CYSTS AND THEIR TREATMENT.

Since the days of Lieutaud and Velpeau, small rudimentary cysts arising outside the ovary have obtained recognition; their origin in the broad ligament by cystic dilatation of the canal of Rosenmüller, has been demonstrated by Broca and others. Bird at an early date called attention to their surgical treatment and contents, and in recent times the question of certainty in their differential diagnosis from ovarian tumors, the possibility of radical cure, the nature of their contents, and the pathology of the subject, have all met with full investigation at the hands of the most able authorities. The description of these tumors as given by the majority of authors is as follows: "They are unilocular cysts, situated in the neighborhood of the ovary, but always independent of that organ and characterized (1) by containing a liquid, clear and limpid as spring water, of low density and with little or no albumen; (2) by having thin walls, transparent and but slightly vascular; (3) by their benign character and the ease with which they are cured by simple tapping.

Much discussion has arisen on the above points. As regards the exact source whence these tumors spring, many opinions have been given. DR. TERILLON admits (*Annales de Gynécologie*, December, 1885) that the broad ligaments may be the seat of cystic tumors of varied nature and multiple origin, though he insists that the most frequent variety consists of those which contain a limpid, not stringy liquid, and spring from the parovarium or analogous organ (called the organ of Rosenmüller), and for which the appellation *parovarian* should be retained. As regards the unilocular constitution and contents of these tumors, there is no hard and fast rule; in some cases cysts of the broad ligaments are multilocular, and their contents resemble those of ovarian tumors, just as the liquid contents of true ovarian tumors sometimes resemble exactly those of tumors considered peculiar to broad ligament cysts. The probable truth is that the clear, limpid, non-albuminous fluid of a low specific gravity is diagnostic of a cyst arising from the remains of the Wolffian body, while in other cases the cyst is probably of ovarian origin, having its base of implantation in the broad ligament, or being incarcerated within its folds. The relations of these cysts to the neighboring organs are interesting; when the tumor has unfolded the fimbriated extremity of the tube it comes in contact with the hilum, and, continuing to develop, carries the ovary on one side; should the cyst grow toward the uterus, it renders the latter more or less immovable (an important point in diagnosis). In rare instances it strips up the peritoneum before it, becoming thus extraperitoneal; in some cases the Fallopian tube is found stretched



over the tumor as a bridle. The ovary itself may be atrophied, hypertrophied, only slightly altered or normal. The diagnosis of parovarian cysts from cysts of the ovary is not easy; no one sign can be said to be pathognomonic, the following characteristics are, however, of value: Slow development, good general condition of the patient, and especially only medium fulness of the sac, which is but little distended. Briefly, it may be said that when a unilocular cyst, slowly developed, occurs in a young woman whose general health is good, and when the liquid obtained by puncture is clear, limpid, not stringy, and presents the necessary features on analysis, the diagnosis of parovarian cysts may reasonably be made.

**TREATMENT.**—Medical treatment is of no avail; surgical treatment may be either palliative or curative. For a long time simple puncture of the cyst was considered quite sufficient to insure a permanent cure, but more recent researches have demonstrated that many of these so-called cures were only temporary, and the more radical treatment of excision was finally necessary. The author illustrates this point by eight cases.

In all of these cases the diagnosis of parovarian cyst was certain; in all, the fluid showed the usual characteristics—low density, small amount of albumen, absence of paralbumen, somewhat high proportion of chloride of sodium, very small amount of solids after desiccation, and, lastly, perfect transparency, with color little or not at all marked.

The author has collected over seventy cases in which a cure was claimed after one tapping, but in all these cases the mistake had been made of not allowing a sufficient time to elapse before considering the cure permanent; the sac of the tumor may lie empty and shrivelled for months or even years, and yet fill again with the fluid. So difficult is it to fix any time after tapping at which a cure can be judged complete, that one is justified in considering cure after puncture as the exception and relapse as the rule.

*Tapping with subsequent injection of iodine.* The author only mentions this treatment to condemn it.

*Extirpation.* There does not appear to be any objection to this procedure, and in the hands of many surgeons the success obtained has been very great. The author comes to the following conclusions:

(1) Parovarian cysts, the fluid contents of which are limpid, not stringy, and devoid of paralbumen, return after complete evacuation of their contents.

(2) This return, though usually slow, and possibly occurring only after an interval of three or four years or more, may occur within a few months.

(3) The interval of time between tapping and return of the fluid is such as to simulate complete cure, and has proved a source of error.

(4) It is difficult to say exactly in what proportion of cases the tumor returns, but it is more often the rule than the exception.

(5) There are some well-established cases, though few, in which a complete cure has been obtained after one or more tapplings.

(6) Ought tapping, therefore, always to be practised in supposed cases of parovarian cysts?

(7) Removal, complete or incomplete, is indicated after relapse; the results are good, the mortality being below fifteen per cent.

(8) Removal is preferable to injection of iodine.

## UNILATERAL PYOKOLPOS.

DR. LUDWIG KLEINWÄCHTER, in the *Zeitschrift für Geb. und Gyn.*, xi. r. 260, describes a rare form of vagina duplex, in which one side is normal or nearly so, while the other is fully developed in its middle portion, but closed at both extremities.

"M. A., æt. forty-five; menstruation normal till lately, when, owing to the approaching climacteric, some irregularity has set in. Has always enjoyed good health. Confined seven times (25, 24, 23, 21, 19, 13, and 12 years ago). When first pregnant, she noticed that a tumor was forming in the neighborhood of, and with a tendency to protrude from, the vagina. It did not increase much, and soon ceased to give her any trouble. In the winter of 1883-84, the tumor again began to grow, gradually increasing till it reached the size of a fist, protruded from the vagina, and caused the patient difficulty in walking. About July 1, 1884 (three weeks ago), suddenly, and without much pain, pus was discharged from the tumor, the latter immediately becoming smaller. There has never been any urinary trouble, nor has her general health suffered."

On examination, Kleinwächter found the external generative organs normal. The anterior vaginal wall protruded from the vagina, forming a swelling of the size of a small apple, closely resembling a prolapse of the anterior vaginal wall. About the middle of the protruding fluctuating mass (corresponding to its summit) was an opening as large as a pin's head, out of which trickled healthy looking pus. Pressure caused a gush of pus to take place. A fine probe could readily be introduced through this opening for a distance of four inches without causing any pain, its point evidently passing into a cavity of considerable size, which, however, had no connection with either urethra, bladder, or vagina. The latter appeared somewhat smaller than normal. The size, shape, and position of the uterus could not well be made out, owing to the obstructing tumor. The meatus urinarius was slightly displaced downward.

A director was introduced into the opening in the swelling, and its wall freely incised both upward and downward, allowing about two ounces of laudable pus to flow out. To prevent adhesions from taking place, a semilunar piece was then excised from the anterior wall. The free opening thus formed closely resembled the ordinary vaginal aperture, and was situated immediately above the proper vagina. On introducing a speculum, the walls were found exactly to resemble those of a case of chronic catarrhal vaginitis. The parietes were very red, supplied with rugæ and greatly enlarged papillæ, just as they are met with in chronic granular catarrh. The cavity formed a wide cylindrical canal, ending above in a cul-de-sac, but readily admitting a tubular speculum,  $1\frac{1}{4}$  inches in diameter. No trace of a portio vaginalis could be discovered. The thickness of the wall between this blind canal and the vagina amounted to several millimetres.

Microscopical examination of the portion removed showed nothing unusual. From without inward epidermis, dermis, corium (with the usual papillæ) were to be seen, followed by a fairly thick layer of subcutaneous connective tissue, supplied by numerous relatively wide vessels. Then came a mucous

layer consisting of large stratified squamous epithelium cells, with a free surface bounding the cavity. The same kind of epithelium lined the whole internal surface of the canal; the fluid contents were found to consist of ordinary pus.

The further history of the case may be given in a few words. The cavity was irrigated with a carbolic lotion till the incised edges had healed, and afterward astringent injections were used to cure the catarrhal condition. Fifteen days after the operation she returned home, free from her previous trouble.

The internal genital organs were not carefully explored until the wound had healed.

The vagina proper has a normal width, and measures  $3\frac{3}{8}$  inches in length; the uterus belonging to it has a normal length, though somewhat narrow. It does not lie in the median line, but to the right of it, and curves outward in that direction. The right ovary is normally situated. The blind canal is  $3\frac{4}{5}$  inches long, and somewhat wider than the vagina. Its lower end lies a little above the vagina, further on it runs parallel to it, so that its course as a whole tends to wind spirally round the vaginal canal. On bimanual examination, there is found lying immediately above the convex end of the blind sac, though apparently not connected with it, a cylindrical body as big as a filbert, passing outward and to the left, and with an enlarged outer end.

Its inner end is in contact with the cervix, though whether actually continuous with it or not could not be determined. The left ovary is *in situ*, but smaller and softer than the right. The wall between the vagina and the blind canal appears moderately thick, and is now thrown into folds, owing to the diminished tension. The patient has an unusually large pelvis, especially as regards width.

There are two ways in which an imperforate or rudimentary formation of the vagina may be brought about. Either the hollowing out of Müller's body (from which it is formed) may be retarded, or, after Müller's body has already become tubular, it may again become closed in different parts of its length, in consequence of inflammatory processes. The first has been called primitive, the second secondary atresia. It is by no means unlikely that numerous so-called vaginal cysts have been really rudiments of a vagina, and that the fluid contained in them is the result of inflammation during foetal life. They would then be cases of secondary atresia. Those, on the other hand, in which the second vagina is well formed, except that the upper and lower ends are closed, are instances of a primitive atresia, not necessarily involving any accumulation of fluid. The latter will only form when either excessive secretion is induced by some external cause, or inflammation sets in, or if extravasation of blood takes place—*e. g.*, from a wound. A common source of irritation is met with in pregnancy and parturition; the mechanical and physiological alterations being quite sufficient for the purpose. This is illustrated by the above case as well as by one published by Smolsky, in which the existence of the second vaginal canal was only noticed when pregnancy set in. Pregnancy and parturition may, of course, have a similar influence on a case of the primitive variety. This appears to have happened in those published by Gräfe and Freund, in which the so-called congenital cysts seemed to grow at each confinement.

Whether the sac forms a pyokolpos or hæmatokolpos, does not depend on its origin, but on the degree of irritation caused by pregnancy, or the extent of injury done at the birth.

Accompanying the vagina duplex we may have a double uterus, though this association is not essential.

The clinical features of unilateral pyo- or hæmato-kolpos differ in important points from one in which the collection of fluid occupies the whole length of one-half of a double genital canal (utero-vaginal). The onset of menstruation and its recurrence do not affect the unilateral imperforate vagina. All the symptoms characterizing the cases in which a uterus duplex accompanies the vagina duplex (regular recurring pains and the formation of an abdominal tumor, in spite of the menstrual flow) are absent. Either stationary vaginal cysts are present, or no indication whatever of any malformation of the genital system is found. Only when increased secretion or hemorrhage takes place into the second closed vagina do symptoms arise; these are mainly mechanical in nature—*e. g.*, the vagina may be encroached upon, or dysuria is complained of. If the swelling be left to take its natural course, the fluid contents are sooner or later discharged.

If the rudimentary vagina is only represented by small cysts, diagnosis is difficult, if not impossible; evacuation of the fluid contents assists to some extent; if the swelling is due to remains of the second vagina, the following characteristics generally hold good: the cyst lies more deeply, its wall is lined with stratified squamous epithelium, and is supplied with bloodvessels, muscular tissue, and papillæ. But on none of these features can absolute reliance be placed; the microscopical points of distinction between these cysts and those due to other causes are, therefore, very indefinite.

Some help is got by the relation of the malformed to the healthy half; if it tends to take a spiral course and resembles the latter in size, if, moreover, the naked eye and microscopical characters resemble those found on the healthy side, and especially if the uterus is bifid, there are good grounds for diagnosing the case as one of vagina duplex.

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## MEDICAL JURISPRUDENCE AND TOXICOLOGY.

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UNDER THE CHARGE OF

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### DEATH BY DROWNING.

DRAPER, of Harvard University, has recently communicated to the Massachusetts Medico-Legal Society (*London Medical Record*, Jan. 15, 1886) the results of an inquiry into the signs, etc., of death by drowning, based on a personal inspection of 149 cases. In summarizing the anatomical proofs of



death by submersion, he divides them into two groups, viz., those indicating the generic cause of death (asphyxia), and those especially showing that the death was by drowning. Among the former he adds nothing which is new. The latter may, however, be mentioned here, although they are for the most part, if not wholly, what are everywhere regarded as signs of death by drowning. They are fine froth at the lips and nostrils, and in the trachea and bronchi; water in the bronchi, with or without mud or other foreign matters; extreme distention of the lungs, with superficial emphysema; water in the small bronchioles and in the vesicles, as shown by the free escape of fluid from the cut surface of the lung; thin, clear fluid in the pleural cavities; water, particularly muddy water, in the stomach. As confirmatory signs are mentioned *cutis anserina*; the presence of objects clenched in the hands and clearly derived from the water in which the body was found; blanching of the palms and soles; marked lividity of the face, with injection of the conjunctivæ.

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#### ATROPINE POISONING.

KRATTER contributes a paper of considerable value on poisoning by atropine and belladonna (*Viertelj. f. gericht. Med.*, Bd. xlv. S. 52-95, 1886). It is based on a careful study of eight cases within his own experience, and is mainly concerned with the best methods for detecting the poison in the body. The conclusions at which he arrives are as follows:

(1) The detection of the poison in the corpse is certain, provided proper methods are employed.

(2) The urine is especially valuable for this purpose, as the alkaloid appears to be almost entirely excreted by the kidneys, and apparently without change. It can even be found there in cases which have not terminated fatally.

(3) The microscopic, especially the crystalloscopic, examination in polarized light of the fine crystalline residue of the urine is recommended as a preliminary step in the process of detection, since the crystals of sulphate of atropine are tolerably characteristic in form.

(4) But while the crystalloscopic test is not to be neglected, not perhaps the Gulielmo-Brunner chemical test (peculiar odor on heating with concentrated acids), positive proof of the presence of atropine is only to be found in the well-known action of the poison on the pupil. And the best of all eyes for this purpose, because much the most sensitive, is the human eye; next comes that of the cat. The eyes of dogs and rabbits are not to be relied on, if the atropine exists only in small quantity.

(5) Atropine shows great resistance to putrefactive decomposition, and therefore may be looked for in bodies dead for some months.

(6) As the atropine is rapidly excreted in the urine, it may happen that if the person survives for a few days, the poison cannot be found in the body.

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#### TESTS FOR ATROPINE.

PROFESSOR FLÜCKIGER contributes an interesting paper on this subject to the *Pharmaceutical Journal* (Ser. 3, vol. xvi. pp. 601, 602, 1886), which is mainly the outcome of A. W. Gerrard's discovery (*Ibid.*, xiv. pp. 718 and 729) that

the mydriatic alkaloids possess a greater alkalinity than other natural alkaloids, as is shown by the fact that atropine and hyoscyamine precipitate mercuric chloride, while the other natural alkaloids fail to do this. Flückiger confirms this observation, and gives still further proof of the exceptional alkaline power of the mydriatic alkaloids by stating that these alone among alkaloids have the power to redden a solution of phenol-phtaleïn. He therefore recommends the use of mercuric chloride and of phenol-phtaleïn for the detection of atropine and hyoscyamine. Obviously, however, one must, before applying the reagent, exercise the greatest care in freeing the alkaloidal solution from the presence of mineral alkalies or alkaline carbonates. The author gives a modification of some of the other tests for atropine. For example, he recommends that a milligramme of atropine and an equal quantity of nitrate of soda should be rubbed together on a white slab by means of a glass rod moistened with a very little strong sulphuric acid (sp. gr. 1.84); then a little sodium hydrate is rubbed in a mortar with absolute alcohol, so as to form a saturated solution, which is added drop by drop to the oxidized alkaloid on the slab, when a red or violet color is developed.

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#### THE ALKALOIDS OF JABORANDI.

PROF. HARNACK (*Arch. f. exp. Path. u. Pharm.*, Bd. xx. S. 439-445) gives the result of a careful examination, chemical and toxicological, of the new alkaloid, pilocarpidine, discovered in the leaves of jaborandi by Merck, of Darmstadt. Pilocarpidine ( $C_{10}H_{14}N_2O_2$ ) decomposes easily into a new base, jaboridine ( $C_{10}H_{12}N_2O_3$ ), just as pilocarpine ( $C_{11}H_{16}N_2O_2$ ), the formerly discovered alkaloid of jaborandi, decomposes into jaborine. The relationship of pilocarpine to nicotine ( $C_{10}H_{14}N_2$ ) was pointed out some years ago by Harnack and Meyer. The existence of this relationship is now more fully demonstrated by the discovery of pilocarpidine, as a comparison of their formulæ will show. Indeed, it is possible that pilocarpidine is a dihydroxyl-nicotine. This alkaloid has the same, though weaker, action on the animal organism as pilocarpine; and a like result was obtained in comparing jaboridine with jaborine.

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#### ALLEGED COCAINE POISONING.

SPEAR (*Medical Record*, New York, November 14, 1885) relates a case of apparent poisoning by cocaine subcutaneously injected. The case was that of a drunken soldier who, for the alleged purpose of sobering himself injected what there is every reason to believe was a solution of cocaine. In half an hour, without previous exhilaration or excitement, he fell into a deep sleep. Two hours later, when he was visited by a surgeon, he was found to be perfectly comatose, face cyanosed, pupils very much contracted, skin pale and bathed with perspiration, respiration very slow and shallow—not stertorous, pulse slow and of fair volume. The surgeon diagnosed the case as one of opium poisoning and treated it accordingly, using the stomach-pump, which, however, brought up nothing, injecting atropine hypodermatically, and spanking the legs and buttocks, etc. After taking coffee several times the patient finally vomited, and showed signs of return-

ing consciousness in about an hour and a half from the commencement of the treatment. Three hours later he was able to walk alone, but was very sleepy, though not allowed to sleep longer than five minutes at a time. Three and a half hours after this he was permitted to sleep for an hour, and was easily waked.

It appeared from inquiry afterward, that the soldier had been addicted to the use of cocaine to allay a craving for alcoholic stimulants, and it was proved that he had recently bought ten grains of muriate of cocaine, which he had dissolved in water and injected a syringeful every few hours, commencing thirteen or fourteen hours before he injected the final dose. He had used the whole of the cocaine.

This case is interesting as one of the first recorded cases of cocaine poisoning. It is highly doubtful, however, whether it is a real case of poisoning by cocaine, since this drug has never had attributed to it so great a toxicity as the circumstances of this case imply.

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#### POISONING BY DECOMPOSED CODFISH.

BERENGER-FERAUD (*Annales d'hyg. publ.*, Ser. 3, t. iv. p. 516) thus concludes a lengthened inquiry into this subject: It is established beyond doubt that decomposed dried codfish is sometimes capable of producing poisonous effects. These effects are similar to those of cholérine, or cholera nostras, consisting mainly of violent gastro-intestinal irritation, which rarely ends fatally. The fungus which is often found growing on such fish, is not the poisonous agent. It is the putrid flesh itself which acts poisonously. As a prophylactic measure, the author recommends repeated steeping of the fish in a large quantity of water, followed by a thorough cooking. If in spite of this the cod retains its putrid odor, it ought to be rejected.

The author compares the poisonous action of putrid cod with that of putrid sausages, and remarks that though the latter is generally much more energetic and serious, the poisonous agent is much the same in both. The main difference lies in the fact that the sausage poison is more readily absorbed than the cod poison, and thus reaches and attacks vital organs.

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#### POISONING BY MUSSELS.

A committee appointed by the German Government, and presided over by Virchow, has recently completed its investigation of a number of cases of fatal poisoning from the eating of mussels, which occurred lately (*Lancet*, December 5, 1885). It was supposed, in accordance with a long-standing though frequently disproved belief, that the poisoning was due to the mussels having contained copper with which they had become impregnated while adhering to two vessels from which they had been gathered, and which were supposed to be copper-sheathed. The commission was able to show that this was not the case, and it is therefore to be hoped that in the future we shall cease to attribute the occasional poisonous action of mussels to copper. The mussels were found to be of a different species from the edible mussel, though closely resembling it, and they were proved to contain a poisonous alkaloid, apparently identical with curarine.

## ERGOT.

DR. KOBERT (*Schmidt's Jahrbücher*, Bd. 207, No. 9, S. 237, 1885), in continuation of his well-known investigation of the active constituents of ergot, now gives an account of all the cases of ergot poisoning published during the last hundred years or so, but which have not been reported in the *Jahrbücher*. All cases of ergot poisoning he designates as sphacelic acid poisoning, since he has discovered that the main poisonous constituent of ergot is that acid. Many of these cases are of interest to the practitioner, as affording an indication of the extent to which ergot may be administered medicinally without producing gangrene. In one case, the patient, a woman of twenty-five years, suffered from gangrene of the extremities two months after she had taken 20 centigrammes (3 grains) of ergot daily for a period of one month. In another similar case, a boy of thirteen received the same dose for a period of two months; but ten days later fever set in with thoracic pain, which in two days developed into gangrene of the lungs. These two cases also show that the action of sphacelic acid may remain latent for a considerable time.

Among the other cases summarized by Kobert are three of acute ergot poisoning which, on account of the rarity of this form of poisoning, deserve notice. They occurred in Russia in 1884. Three pregnant women had taken large doses of ergot, and all three died within a very short time. The most prominent symptoms previous to death were feebleness of pulse, violent thirst, vomiting, bleeding from uterus, and unconsciousness. The post-mortem appearances were tolerably alike in all: skin icteric; blood escaping from genitals (in one case a small fœtus embedded in the coagula); several ecchymoses in subcutaneous tissue, also under pleura and pericardium, former visible through the skin in many places in the limbs; extravasations of blood also under peritoneum, in lungs, and in kidneys. In the uterus of one there was a four months' fœtus, with sanguineous mucus in the vagina; in the uterus of another, a four to six weeks' fœtus, with loose clots of blood between the villi of the chorion and the uterine wall; the uterus of the third, as already mentioned, had discharged the fœtus. The contents of the stomach and intestines were dark colored, and were found to consist largely of ergot. The mucous membrane was pale in some places, reddened in others, and ecchymosed in one case.

Kobert also quotes some cases in which cataract of the lens followed the prolonged taking of ergot. Such cases are not very rare. Finally, Kobert advances the opinion that in those cases of ergotism in which the spinal cord is affected, sphacelic acid probably causes the changes in the cord by contracting its bloodvessels. For the benefit of those who are not familiar with the results of Kobert's earlier communications, it may be stated that this effect on the bloodvessels is that to which Kobert refers all the poisonous activity of sphacelic acid.

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 INFLUENCE OF AGE ON THE ACTION OF STRYCHNINE.

F. A. FALCK (*Arch. f. d. ges. Physiologie*, xxxvi. p. 285, 1885) has extended his experiments on this subject to guinea-pigs and mice—his former experiments were on rabbits. He sums up the results of all his experiments in the statement that the newly born animal is relatively very insensible to the



action of strychnine, but that the sensibility very rapidly increases until the tenth day in the rabbit, and the fifteenth in the mouse, when sensibility is greatest. After this period, as age increases the sensibility diminishes until maturity is reached, when it becomes constant and normal.

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#### CHLORATE OF POTASSIUM.

V. MERING has published an exhaustive memoir on the physiological, toxic, and therapeutic effects of this salt (*Das Chlorsaure Kali*, Berlin, 1885, pp. 142). He has employed what appears to be a satisfactory method for the determination of the chlorate in the urine, etc. With the help of this, he shows that nearly the whole of the chlorate passes through the body unchanged, and almost entirely reappears in the urine—*e. g.*, he recovered 4.62 grammes out of 5 grammes which he had himself swallowed.

Based, however, on the fact that the blood outside the body reduces the chlorate, he admits the probability of such a reduction taking place inside the body, but only to a very limited extent. And, indeed, this appears to be proved by the chocolate color of the blood of animals poisoned by the chlorate, the chocolate color being due to the formation of methæmoglobin. But as such blood quickly undergoes change, returning to the normal after death, it is advisable to make the post-mortem in cases of chlorate of potassium poisoning as soon as possible. V. Mering further shows from experiments on animals, and also with blood outside the body, that elevation of temperature and decrease of alkalinity of the blood increase the amount of the reduction. He offers this as an explanation of the variability in the poisonous action of the chlorate. Febrile persons are therefore more susceptible than others to the action of the salt, more especially if the alkalinity of the blood is diminished by the drinking of acid lemonades, etc.

The author gives a description of the typical symptoms of poisoning by the salt, which are chiefly obstinate vomiting, profuse diarrhœa, great dyspnœa, marked cyanosis, and feebleness of heart. Post-mortem: blood, chocolate-brown; organs generally little changed.

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#### ARSENIC.

CHITTENDEN and HERBERT E. SMITH (*Medico-Legal Journal*, vol. iii. pp. 145-148) report the analyses of the organs and tissues in two cases of arsenical poisoning—the one by arsenious acid, the other by Paris green (aceto-arsenite of copper). In both cases merely a trace of arsenic was found in the brain, although a considerable quantity was found elsewhere. This, they say, affords additional evidence of the view already advanced by Chittenden, that in poisoning with arsenic the presence of an appreciable amount of poison in the brain is a reliable indication of the administration of a soluble and diffusible form of arsenic—*e. g.*, sodium arsenite.

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#### TOXICITY OF SALTS OF COPPER.

Considerable difference of opinion exists as to the toxicity of copper salts, some authorities maintaining that they are highly poisonous, others that they are not, unless in very large doses. The question as to which is right is of

some importance, since copper is a common adulterant of pickles, etc., and otherwise occasionally contaminates food. PROF. DUMOULIN (Ghent) has therefore recently undertaken the reinvestigation of the subject, results of which are reported in the *Semaine Médicale*, December 2, 1885. His experiments were made mainly on dogs and rabbits. Doses of sixty to ninety grains of cupric sulphate had no serious effects. The subacetate (verdigris), the carbonate, the oxide, and the oleopalmitate were similarly tried, though in somewhat smaller doses, and were found to be not more harmful than the sulphate. Vomiting was produced when the dose was large. The salts were even, in some instances, administered daily for a year without leading to a fatal result. Observing that one of the dogs which was suffering from impetigo became cured of the eruption during the administration of the copper, the author tested the value of cupric sulphate, in one grain doses daily, in the treatment of impetigo and various other skin diseases in children, with good results.

The conclusion of medico-legal value to be drawn from the author's experiments, is that foods containing copper salts in small quantity are not likely to have injurious effects even though consumed over a long period of time. In spite of this, however, it would be unwise for medical officers of health to regard adulteration with copper as other than injurious.

#### ARSENICAL POISONING OF A CHILD THROUGH MOTHER'S MILK.

BROUARDEL and G. PONCHET (*Annales d'hygiène publ.*, t. xiv. pp. 73-86) have reported to the Société de Médecine légale de France the results of an inquiry into an important and probably unique case of poisoning of an infant by arsenic, where it was alleged that the poison had been introduced through the milk of the mother, whom her husband had unsuccessfully endeavored to kill by means of arsenic. The mother recovered after vomiting and diarrhœa, but the infant of two months succumbed after exhibiting the same symptoms. The body of the child was exhumed twenty months later, and after a careful chemical analysis of the cadaver and its surroundings, the authors were satisfied that arsenic was present in the body to the extent of about five mgms., a quantity, in their opinion, sufficient to have killed so young an infant. They afterward made experiments on nursing women, guinea-pigs, rabbits, and dogs, and found that arsenic, when administered to the mother, passes freely into the milk, and, in the case of the lower animals, is detectable in the bodies of the sucklings. In one case, that of the dog, they succeeded in killing one of three pups by administering arsenic to the mother, although the mother recovered.

#### RELATIVE TOXICITY OF THE ORGANIC AND INORGANIC CONSTITUENTS OF THE URINE.

It is known that the toxicity of normal human urine when injected into the veins is mainly due to the inorganic constituents. LÉPINE and AUBERT (*Compt. rend.*, C. I. No. 1) have now found that the toxicity of urine from fever patients is, on the other hand, largely due to the organic constituents. 60 c. c. of normal urine, per kilogramme of weight of animal, sufficed to kill a dog; the ash of 65 c. c. produced the same result. But if fever urine were employed, 25 c. c. of the urine itself, or the ash of 40 c. c., proved lethal.

## PUBLIC HEALTH.

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 UNDER THE CHARGE OF

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 DISINFECTION.

A series of papers on disinfection will be found in the *Report of the Medical Officer of the Local Government Board*. The first, by DR. KLEIN, confirmed experiments previously performed, which showed that swine fever could be communicated to healthy pigs through the air by placing them in the same stable with diseased animals, but so separated from them that no bodily contact could take place between the diseased and the healthy, and also showed that infection did not take place if chlorine were present in the air of the stable.

Experiments with sulphurous acid showed that when the animal used for imparting infection was suffering with severe swine fever, healthy animals introduced into the stable, the air of which was charged with this gas, contracted the disease and died of it. When, however, the disease-giving animal suffered in a mild form and was free from severe pulmonary symptoms, no infection took place.

A second series of experiments proved that exposure of the blood of splenic fever for half an hour to a  $3\frac{3}{4}$  per cent. solution of phenylpropionate of sodium deprived it of its infecting power.

A third series of experiments by Dr. Klein and Mr. Lingard showed that the steeping of the tuberculous material of known infective activity in  $1\frac{1}{2}$  per cent. solution of either phenylpropionic or phenylacetic acid rendered it inert. A less than 10 per cent. solution of phenolsulphonate of sodium was inoperative, but a 15 per cent. solution used for steeping tuberculous matter for sixteen hours or more deprived it of its infectivity. Other experiments by Dr. Cash showed that guinea-pigs, which were given daily doses of four grains, and rabbits nine grains of phenolsulphonate of sodium, were found to be not less susceptible than other animals to the virus of tuberculosis. The administration daily of about  $\frac{1}{160}$ th of a grain of corrosive sublimate appeared to confer on guinea-pigs and rabbits some power of resisting the virus of anthrax.

Another paper in the same report gives an account of experiments with various apparatus for disinfecting by means of dry and moist air, by DR. PARSONS, who was led to the following conclusions:

1. With the exception of spore-bearing cultivations of the bacillus of anthrax, all the infective materials experimented on were destroyed by an hour's exposure to dry heat of  $220^{\circ}$  F., or five minutes' exposure to steam at  $212^{\circ}$  F. Spores of bacillus anthrax required for destruction four hours' exposure to dry heat of  $220^{\circ}$  F., or one hour's exposure to dry heat of  $245^{\circ}$  F., but were destroyed by five minutes' exposure to a heat of  $212^{\circ}$  F., in steam or boiling water.

It may be assumed that the contagia of the ordinary infectious diseases of mankind are not likely to withstand an exposure of an hour to dry heat of 220° F., or one of five minutes to boiling water or steam of 212° F.

2. Dry heat penetrates very slowly into bulky and badly conducting articles, as bedding and clothing; the time commonly allowed for the disinfection of such articles being insufficient to permit an adequate degree of heat to penetrate into the interior.

Steam penetrates far more rapidly than dry heat, and its penetration may be aided by employing it under pressure, the pressure being relaxed from time to time, so as to displace the cold air in the interstices of the material.

3. Scorching occurs at different temperatures with different materials, white wool being soonest affected. It is especially apt to occur where heat is in the radiant form. To avoid risk of scorching, the heat should not greatly exceed 250° F., and even this temperature is too high for white woollen articles.

4. By a heat of 212° F. and upward, whether dry or moist, many kinds of stains are fixed in fabrics so that they will not wash out. This is a serious obstacle in the way of the employment of heat for the disinfection previous to washing of linen, etc., soiled by the discharges of the sick.

5. Steam disinfection is inapplicable in the case of leather or of articles which will not bear wetting. It causes a certain amount of shrinkage in textile materials—about as much as an ordinary washing. The wetting effect of the steam may be diminished by surrounding the chamber with a jacket containing steam at a higher pressure, so as to superheat the steam in the chamber.

6. For articles that will stand it, washing in boiling water (with due precautions against reinfection) may be relied on as an efficient means of disinfection. It is necessary, however, that before boiling the grosser dirt should be removed by a preliminary soaking in cold water. This should be done before the linen leaves the infected place.

7. The objects for which disinfection by dry heat or steam is especially applicable are such as will not bear boiling in water—*e. g.*, bedding, blankets, carpets, and cloth clothes generally.

8. The most important requisites of a good apparatus for disinfection by heat are (*a*) that the temperature in the interior shall be uniformly distributed; (*b*) that it shall be capable of being maintained constant for the time during which the operation extends; and (*c*) that there shall be some trustworthy indication as to the actual temperature of the interior at any given moment. Unless these conditions be fulfilled, there is risk, on the one hand, that articles exposed to heat may be scorched, or, on the other hand, that through anxiety to avoid such an accident the opposite error may be incurred, and that the articles may not be sufficiently heated to insure their disinfection.

9. In dry-heat chambers the requirement (*a*) is often very far from being fulfilled, the temperature in different parts of the chamber varying sometimes as much as 100°. This is especially the case in apparatus heated by the direct application of heat to the floor or sides of the chamber. The distribution of heat is more uniform in proportion as the source of heat is removed from the chamber, so that the latter is heated by currents of hot air rather than by radiation.



10. In chambers heated by gas, when once the required temperature has been attained, but little attention is necessary to maintain it uniform, and in the best made apparatus this is automatically performed by a thermo-regulator. On the other hand, in apparatus heated by coal or coke the temperature continually tends to vary, and can only be maintained uniform by constant attention on the part of the stoker.

11. In very few hot-air chambers did the thermometer with which the apparatus was provided afford a trustworthy indication of the temperature of the interior; in some instances there was an error of as much as  $100^{\circ}$  F. This is due to the fact that the thermometer, for reasons of safety and accessibility, was placed in the coolest part of the chamber, and that the bulb, being enclosed for protection in a metal tube, was screened from the full access of heat. The difficulty may be overcome by using, instead of a thermometer, a pyrometer actuated by a metal rod extending across the interior of the chamber.

12. In steam apparatus the three requirements above mentioned are all satisfactorily met, and for this reason, as well as on account of the greater rapidity and certainty of action of steam, steam chambers are, in Dr. Parson's opinion, greatly preferable to those in which dry heat is employed.

13. Without wishing to give the preference to one maker over another, he mentions that of the apparatus heated by coal, Bradford's newer machine; of those heated by gas, the Nottingham self-regulating disinfecting apparatus; and of those employing steam, Lyon's patent steam disinfector, in his experiments gave the best results of any in their respective classes.

14. It is important that the arrangement of the apparatus, the method of working, and the mode of conveyance to and fro, should be such as to obviate risk of articles which have been submitted to disinfection coming into contact with others which are infected.

The recommendation of the American Public Health Association, that the following standard preparations should be used as disinfectants, has been adopted by the Iowa State Board of Health.

The preparations are:

1. Chloride of lime, four ounces to the gallon of soft water. For the disinfection of excreta.

2. Corrosive sublimate and permanganate of potash, two drachms of each to the gallon of water. For the same purpose as No. 1.

3. Labarraque's solution (liquor sodæ chlorinatæ), one part to five parts of soft water. For the same purpose as No. 1.

4. Pulverize one ounce of corrosive sublimate and mix thoroughly with nine pounds of plaster; add one pound of chloride of lime, and mix thoroughly. To be sprinkled on the surface of excreta.

5. Corrosive sublimate, four ounces dissolved in one gallon of water; add one drachm of permanganate of potash to each gallon, to give color to the solution. One fluidounce to the gallon of water will make a suitable solution for the disinfection of clothing.

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